The Builder.

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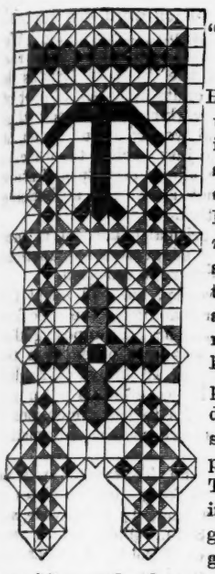


"Principles of Decorative Design."

THE work published under the above title * is a reprint of the substance of a series of essays written by Dr. Dresser for the *Technical Educator*, and specially intended for the encouragement and assistance of working men in acquiring a knowlege of the best principles of decorative design, with hints and suggestions for their practical application. The plan of the book in its present form is to give an introductory general definition of the requisites and characteristics of decorative design, the remaining portion showing, in chapters dedicated to different branches of material and manufacture, the manner in which these may be illustrated in practice. In the opening page of the introduction, the author observes that a man born and brought up as a "son of toil," but feeling the ability and ambition to rise above his fellows by fairly becoming their superior, can find no means of accomplishing this so readily as "by acquainting himself with the laws of beauty, and studying till he learns to perceive the difference between the beautiful and the ugly, the refined and the coarse." That this kind of perception is with nearly all Englishman an acquired one, is, as here hinted, an unfortunate fact, which it is as well to state plainly. Not less *àpropos* is the warning to the student, not to take for granted the judgment of those persons, women especially (ungallant decorator!), "who suppose themselves to be possessed of good taste. It is common to assume that women have better taste than men, and some women seem to consider themselves the possessors of even authoritative taste, from which there is no appeal." This amiable illusion, however, is certainly not so generally prevalent now as it once was.

Dr. Dresser's introduction inculcates that view of the degree of meaning and expression possible in pure ornament which he has enunciated at greater length, and illustrated by some able and rather imaginative designs, in his former larger work on "The Art of Decorative Design"; a view in which there is a great deal that is true and suggestive, though it is to be regretted that the author allows himself to be betrayed occasionally into exaggerated and rather foolish rhapsody about his own particular branch of art. The general principles laid down, under the heads *truth*, *beauty*, and *utility*, are what are not unfamiliar to most of our readers, and are here well and concisely expressed and exemplified. Neither of what may be termed the two opposing prejudices in regard to ornament is adhered to. Disliking the Renaissance ornament (so much and so inconsiderately put forward as the only model by our Government art-instructors), Dr. Dresser has on the other hand no sympathy with the love of irregularity for its own sake which has arisen (logically or not) out of the Japanese mania. Among his axioms is the one that "a principle of order must prevail in every ornamental composition," and that "the orderly repetition of parts frequently aids in the production of ornamental effects." The capability of the expression of "humour" in ornament is enlarged upon, and exemplified by some illustrations which border a little too much on that taste for what may be called "Mediæval childishness," of which in some quarters there has been a great development lately.

Some of the points adverted to in the chapters on special subjects we may touch upon. The chapter on colour gives the usual facts as to the relations of colour in harmonic combinations, together with hints on the carrying out of experiments in chromatic effects; the effect produced by combinations of intense colour in small quantities is recommended, rather than that of masses of more subdued tones, as furnishing greater purity of effect: "if pigments are mixed they are reduced in intensity; but if placed side by side, when viewed from a distance the eye will mix them, but they will suffer no diminution of brilliancy:" a point which can hardly be too strongly urged among people so addicted to either muddy tints, or raw masses of colour, as are the average English decorators.

In the chapter on "Furniture" we see with pleasure an attack upon curves—the absurd and still largely prevalent fashion of working the backs and legs of chairs, &c., into the very weakest forms, both in appearance and reality, which can be devised; an error which reaches its climax in some of the furniture sent from Germany to our Exhibitions. The difficulty in regard to chairs, as we have before pointed out, is to combine solidity and durability with convenient lightness. Two or three designs for chairs given here, of rather a sumptuous character, are excellent in regard to outline and what may be called "expression" (for there certainly is expression in furniture), but which certainly would not be very handy for much lifting about. One or two others that are given show more of a combination of strength and lightness. Certain remarks (p. 62), as to the carving of structural portions of furniture (illustrated by a cabinet from a design of Pugin's") we must dissent from; the ornament is certainly wrongly placed here. The author takes opportunity further on of showing up as it deserves the absurd fashion of making cabinets in mimicry of Gothic structure, with buttresses, sloping roof, and *dormers*; the example given being by an architect of note, who really ought to know better; and records also his righteous indignation at a classic cabinet seen in an exhibition which appeared to be unimpeachable in solidity and truthfulness of structural design, until, the doors being opened, away swung with them the pilasters which had appeared to support the top. The popular looking-glass is branded as it deserves; but the picture-frame given as an example of good work (p. 71), we certainly cannot praise; it is commonplace and coarse, and shows the cross-cornered frame which is so inconvenient, from the amount of space it demands beyond the line of the frame.

The remarks on the decoration of ceilings may be read with profit, both in regard to their positive and their negative axioms. The principles laid down for the decorative treatment of walls are better than the examples given. In regard to wall-papers (p. 87), Dr. Dresser wishes the straight-joint system of hanging to be abandoned, and the paper cut as much as possible to follow the pattern. "If you use paper for the walls, use it artistically, and not as so much paper. Let a dado be formed of one paper, the upper part of the wall being covered with paper of a simple and just design" (what is a *just* design?), "and of such colour as shall harmonise with the dado." But if papers are used, such as we (as well as Dr. Dresser) should recommend, of small geometrical or powdered patterns, it would be almost absurd to think of cutting them to follow the pattern. The joining-lines do not show in well-hung paper, unless one looks for them. This is refining too much about trifles.

In the chapter on carpets, the principle (self-evident, yet constantly overlooked) should be noted, that while wall-papers or decorations may have designs with an upward tendency and a "bilateral symmetry," carpets should always consist of designs with a "radiating symmetry," so as to appear the same in every direction. Among the remarks in regard to designs for stuffs generally, table-cloths, &c., we may call attention to that in regard to articles that have to hang in folds, like the edges of table-cloths, viz., that compound curves, on at all a large scale, are bad in such a position, as they are broken up by the folds into mere wavering lines; whereas straight lines and segments of circles in such a situation naturally meet the eye as correct compound curves; and, as a general rule, that which looks well on a flat surface will look bad on a curved one, and *vice versâ*. Carpets are recommended to be kept "neutral in general tone," either by the employment of tertiary hues, or by small quantities of primary colour in juxtaposition.

In regard to pottery, and the working of hollow vessels generally, we very much concur with Dr. Dresser's observations. He is abundantly right in his remark as to the amount of finish which is often put into articles of this kind, without any art at all. Clay is susceptible of "a bold sketchy treatment," as well as of high finish. "As a rule, however, we over-estimate the value of finish, and undervalue bold art effects. . . . . I have before me some specimens of Japanese earthenware, which are formed of a coarse dark-brown clay, and are to a great extent without that finish which most Europeans appear so much to value; yet these are artistic and beautiful. In the case of cheap goods, we spend time in getting smoothness of surface, while the Japanese devote it to the production of an art effect. We get finish without art; they prefer art without finish." Which deficiency is the most serious there can be little doubt. Our author thinks we should get much more artistic and beautiful shapes if we adhered more to the old "potter's wheel" method of working clay, by which beautiful curves almost design themselves; and a somewhat similar remark will apply to the practice of glass-blowing, and the natural shapes resulting from the process, as compared with many of the more artificial cut-glass shapes and outlines. The accessories of the table are gone into at some length, and some of the shapes given for decanters, jugs, and other adjuncts, are suggestive and suitable. In touching on the ornamental use of silver, we notice the remark, unfortunately too true, that modern European silversmiths have fallen into the error, now almost universally prevalent, of making their works of a *pictorial*, rather than of an ornamental character. The extraordinary creations which we see put forth almost daily as centre-pieces, prize cups, and so on, would warrant much stronger criticism than that indulged in by Dr. Dresser. We have before now condemned them.

It is refreshing to find the prevalent absurdities of stained-glass design (architectural canopies, &c.) so strongly denounced as at p. 156. Of two specimens given by way of example, of a purely ornamental treatment of stained-glass design, both are suggestive, and one has considerable beauty, the other not.

In the main, we can recommend this book to art-workmen, as well and clearly written, suggestive, and based almost entirely on sound and true principles, in regard to the treatment and application of ornament. It is not free from the usual pessimist tendency of

* By Cassell, Petter, & Galpin.

works of this kind; every one who writes on ornament at present deeming it incumbent on him to show how fearfully wrong, bad, and degraded in taste is every article we are in the habit of using. Perhaps this is the best policy, but it is apt to be overdone. All ornamental critics, however, do not offer their thoughts in so liberal and generous a spirit as Dr. Dresser, who concludes his book by assuring the reader that, "If I personally can aid him in any way, I shall be glad to do so. If any who really seek knowledge of decorative design, and are hard workers, choose to send me designs for criticism or comment, or desire any other aid that I can give them, I shall be happy to do what little I can for them. My address will be found at the end of the Preface." After this, we can only adopt the language of Sir Hugh Evans,—"So Got judge me, that is a virtuous mind."

THE OLDEST BUILDERS' SPECIFICATION,

AND SOME NEW LIGHT AS TO ITS MEANING.

THE undying interest which, from the date of the earliest edition of the English translation of the Bible, has been kept up, generation after generation, as to the architecture of that ancient house of prayer, the Tabernacle erected in the wilderness, may be thought to have furnished such a stimulus to inquiry as to have led to the exhaustion of the subject. The name of Dom Calmet will not readily be forgotten. The same patient and accurate care which this great student bestowed on the genealogies of the Imperial Family, and of certain other ancient houses of his day, when directed to the investigation of the architectural details of the Pentateuch, produced graphic illustrations of well-considered detail. Dom Calmet, indeed, drew upon his imagination to supply what he thought must have been indispensable. Thus, in his plans and sections of Noah's Ark, he not only divided the allegorical dimensions given in the Book of Genesis into decks and cabins, but went so far as to show the trunks down which the fodder (from his point of view) was daily thrown by the patriarchs for their charge. The Tabernacle, as well as the Temple, were represented by the learned Benedictine with equal precision. Nor can these early plans be regarded as more purely imaginary than some of the latest which have been offered to the world, with equal or indeed greater confidence; although as the result of much less patient examination of the case.

It may be safely admitted that, unless either newly-discovered facts can be brought to illustrate the subject, or a new method of inquiry can be shown to be possible, the matter had better now be left to the dusty leisure of the cyclopædia and the architectural dictionary; and that the columns of a practical journal have more important claims on their space, than to allow the discussion of such ancient and shadowy structures.

It is the case, however, that the last few years have witnessed the discovery of facts that have a very close relation to this ancient structural problem. And when we observe that some of these facts have been for several years published in different works, but that no one has taken the pains so to collate the information as to derive from it any positive teaching, it will appear that we are not about to tell over again an often-told tale. Further, the information collected, and in course of collection, may be rendered of increased value by the adoption of a method of inquiry somewhat more critical and severe than that which any writer, who has a theory of his own on the subject, appears to be able to prevail on himself to adopt.

In a recent number of the *Builder* (May 10, 1873), we investigated, with some detail, certain architectural terms which were in use in Palestine 2,400 years ago. We then deduced, from what we were justified in terming a very ancient specification, illustrated by certain actual measurements taken by the Royal Engineers, a good deal of positive information as to the plan of the superb Temple erected by King Solomon. In that paper we confined our remarks almost exclusively to plan, without reference to elevation; excepting in so far as the height of the great Peribolus of the Temple was determined by positive survey. Even that subject we did not exhaust, feeling that it was wiser to keep somewhat within the limits of our actual knowledge, than to hazard anything in the shape of a guess. In what we have now to bring forward,—although the primary question is the true rendering of the account which, in minute detail, is thrice repeated in the book of Exodus,—of the structure of the Tabernacle, it will be seen, by those who are at all familiar with the subject, that we shall obtain very much that is suggestive as to the elevation of the Holy House, or *cella* of the Temple, which was built on the normal plan of the Tabernacle.

One point ought to be premised as to any attempt to read, with the eye of an architect, an account that was written in Hebrew 3,400 years ago. It is this. It is hopeless for any one, whose scholarship is confined to modern tongues, to attempt to explain that account. Of the technical passages of the Old Testament, we cannot be said to have even a direct translation in our language. A careful comparison of the original with the Greek, Latin, and English versions, shows that the third of these is taken almost absolutely from the Latin, and not from the Hebrew. The same mistakes are almost invariably made; and the additional obscurity, which is the natural result of a double translation, settles down upon the authorised version. We confine our remarks to these technical passages, because it is only with them we have now to deal.

Two further difficulties attend on such a collation as can alone deserve the name of critical research. One of these is, that the Greek translators, writing, to some extent, under the influence of the Alexandrine Court, and biased by the tone of thought of the learned men whom the Ptolemies collected in Egypt, have frequently left strong impressions of individual opinion on their work. Remarkable differences between a close translation of the Hebrew (as it now exists) and the Greek of the LXX, are familiar to the student. And that these differences result from the individual opinion of the translator, appears from the fact, that the same Hebrew words are translated by different Greek words, in different books of the Bible. Still, no one is justified in concluding that he is in possession of the sense of a difficult passage of the Old Testament, without collating it with the two codices of the LXX, which sometimes differ materially both from each other and from the Hebrew, and nowhere more so than in the present instance.

The other difficulty arises from the fact, that in consulting a Hebrew lexicon, the student is, nine times out of ten, only sent back, hoodwinked, to St. Jerome. We are speaking expressly from experience of one of the oldest and most scholarly of the Hebrew lexicons, that of Buxtorff. As far as translation of Hebrew words is concerned, this valued book is little more than a dissection of the Vulgate. Thus when Jerome, who, whatever he was, was not an architect, has given a vague or incorrect translation of a Hebrew architectural word, the student is in this dilemma. He will find the word used in the Vulgate translated in the authorised version. When he turns to the Greek, he is very likely to find a mere transliteration, or spelling in Greek letters of the Hebrew word. And when he goes back to the original, unless he can bring Arabic or other Oriental tongues to his aid, he will be likely to find his Hebrew lexicon repeat the original blunder of St. Jerome.

In the account of the Tabernacle occurs a remarkable instance of this want of original research. The word which St. Jerome has translated *tabulæ*, and the English writer "boards," occurs in the Book of Ezechiel (xxvii. 6), where Jerome has translated it *transtra*, "thwarts," and the English version, "benches." Accordingly the Hebrew lexicon gives *tabulæ* and *transtra* as the meanings. Any acquaintance with either natural history or shipbuilding would show the absurdity of describing the benches athwart a ship as made of ivory. The word in the Greek is "temples." The etymology of the original rather indicates plates, used in the sense of a shiny surface, like that of ice. But nine students out of ten would be perfectly contented with "*transtra*."

The only safe method, then, we take to be that which we previously indicated; namely, to treat the doubtful words like algebraical expressions; to find what ideas are included, and what are excluded, in each instance of their occurrence; and thus, finally, to attach the true value. This will almost always admit of an etymological verification.

We find it necessary to make these remarks with some degree of distinctness, in order to avoid encumbering our page with Greek and Hebrew type. Our readers, now made aware of the method adopted, will for the most part thank us for presenting the results, and not asking them to accompany our investigation, step by step.

The first thing that will verify the true construing of the accounts of the Tabernacle of Moses (if the passages in which they occur be uncorrupted) will be this. We must find a natural explanation for every term, in its proper place; and we must have neither omissions nor repetitions. When people wrote painfully, letter by letter, not even breaking the line into words, they wrote carefully. Each word was wanted; and each word had its proper meaning. We must therefore think it probable that the specification given in the Book of Exodus is adequate; and that it omits no essential part of the structure. If a workman now took that ancient description, and worked it out, he ought to be able to set up just such a tabernacle; without introducing a single structural feature for which he could not show the authorising clause in the specification.

It is clear that this critical canon will at once exclude a great many suggestive explanations of the form of the structure in question.

For the sake of brevity, we will adopt the unit of the cubit in our reading of the specification. There is no authority for supposing that the cubit here used was any other than the ordinary Jewish cubit, of 16 in., or 48 English barleycorns; as the larger cubit is not in any way here alluded to. As to the dimensions of the ordinary cubit, we have positive information in the Talmud.

The woodwork of the Tabernacle was as follows:—There were forty similar plates or boards, each 10 cubits long, 1½ cubit wide, and 4 digits, or nearly 3 in., thick, which were covered with thin plates of gold. A comparison of the weight of gold employed for all the work, with the superficial area of the woodwork of the Tabernacle, shows that this plating could not have been thicker than the tenth part of the thickness of an English sovereign, or, in round numbers 6 oz. Troy per square foot, if the weights of gold given are stated in terms of the ordinary silver shekel. There is a strong presumption, however, in favour of the opinion that the gold shekel of account, which is only of the weight of one-third of the silver shekel, is employed; and in that case, a corresponding deduction must be made in the estimate of the gold used. The weight of the silver shekel, during the existence of the first temple, was 320 grains. This we know definitely from Maimonides.

These boards, all exactly alike, were jointed (whether by a bird's-mouth groove, a tongue, or tenons and mortises, cannot be distinctly ascertained), but so as to fit together in two unbroken walls of gold. Each board rested on two feet, or bases, of silver, which must have been not very dissimilar to our present railway-chairs, of which they were about the weight, and which were buried in the earth to give fixity to the structure. These two long sides, 30 cubits in length, ran east and west, when the Tabernacle was fixed.

For the west end of the Tabernacle, which was 10 cubits long, six similar boards were made; which, according to our view, were in three pairs, with an angular slope at top, so as to form a sloped or pedimented end to the building. Two corner-pieces, of only half a cubit in width, were specially formed to connect the ends with the sides of the building. All these pieces of wood were jointed in a similar manner, and stood on similar bases. The only point which is to be considered as newly indicated here, is the shape of the end of the structure.

This is arrived at as follows. At each end of the building were five upright pieces, pillars or pilasters, those at the west end standing against the Golden Wall (whether within or without is not clear), and those at the east end sustaining a veil, in lieu of doors. The odd number shows that one pillar was in the midst; and this is an almost certain mark of a double pitched roof.

Eight upright pieces, or pilasters, are then named, the explanation of which, as direct structural elements, is now, we believe, for the first time suggested. Five bars are mentioned as fixed on either side of the building, and one long bar, 30 cubits in one piece, "in the midst between." In this enumeration we read five pairs of rafters and a continuous ridge piece. We thus have an explanation of the eight uprights. Three pairs of them corresponded with the three pairs of intermediate rafters, and were for taking the weight of the roof off the thinner boards of the sides. One pair was at the west end, forming, with the outer of the five end columns, something like a pair of coupled pillars, at each angle.

For the west end a pair of additional uprights was not necessary, because there were already two pillars at each western angle; one being the half-cubit piece, framed in the wall, and the other being the outer of the five bars attributed to the west end of the building.*

On this view the structure is perfectly simple and intelligible. Every word is explained; and the great point is attained, that nothing further is required; no tent-poles, or ridge-lines, or separate fittings for supporting the embroidered linen veil, its outer cover of black woven goat's hair, and the row of red and blue rams' skins on the top; for this we take to be the meaning of the introduction of the word translated "badger-skins," to the confusion of the naturalist, who has been unable to suggest what animal was intended. We read it that these were rams' skins, dyed of different colours, which would give a special peculiarity to the aspect of the sacred tent.

It is quite certain that any ordinary carpenter could construct a perfect model of this building, in wood, linen, and canvas, and could erect it without any hesitation or trouble. It could be easily fixed and removed; and it would always be erected in exactly the same form. The only question thus left open, as to form, is that of the angle of the roof. Here it is that a comparison of certain distinct data becomes useful.

De Saulcy published, in 1854, in his "Recherches sur la Numismatique Judaique," drawings of three Jewish coins, which have been reproduced in Sir F. Madden's "History of Jewish Coinage." Each of these coins shows on the obverse a tetrastyle temple, with a lofty, arched, central door. We do not adopt the views of either of the learned editors in question, as to the exact date and legend of these coins; and that for reasons, taken from Jewish literature which they have not consulted, to which we have no doubt that they would have been the first to adhere. There is no reference, for instance, in Sir F. Madden's learned work, to the positive determination of the silver shekel by Maimonides,—a knowledge of which would have saved a vast amount of confessedly unsatisfactory discussion, and moreover would have given accurate results, instead of erroneous approximation. But that they are Jewish coins, issued during the independence of the nation; bearing, in each instance, on the reverse, representations of objects employed in the services of the Temple; and the name, either of Jerusalem or of Israel, in the peculiar letters found on the coins before the adoption of the Greek letters by the Idumean, and even by some of the Asamonean, kings; there is no manner of doubt whatever. We do not, therefore, see how there can be much reasonable doubt that we have here representations, as faithful as the art of the coiner allowed him to give, of the elevation of the second Temple; and thus an illustration of the permanence of the type "showed in the Mount" to Moses, down to the days of Herod, and probably down to the destruction of the Temple by Titus. It is impossible to believe that any other building could be represented on a coin bearing these sacred emblems and legends.

A less positive, but still very luminous, illustration is found in the proportions of the two small tetrastyle temples of HIBBARIYEH and THELTHATHA, which are figured in "The Recovery of Jerusalem" (a work published in 1871), and which are types of numerous relics and ruins yet existing throughout Tyria. These little fanes all agree very closely in form with that which we have suggested as normal in the Tabernacle. They differ in the one particular of forming double, instead of triple, cubes, but in that almost alone. They open towards the East, with two columns interspaced between two square angle pilasters; which we take to be the form introduced by Solomon, when the central supports for the ridge beam were rendered unnecessary, by the substitution of solid masonry for framed woodwork. Even in the Tabernacle, the same form was adopted in the internal division, where four pillars supported the veil of the *adytum*. The pitch of the roof of these Syrian temples seems to have been the ordinary one, of a rise of one-fifth of the width, giving a slope of 2½ to 1 for the roof. The internal division is into porch and *cella*; the porch being in one instance one-third, and in the other one-fourth, of the entire length of the building. In the Tabernacle the external curtain was so folded and hung as to form a porch. In the Temple of Solomon the porch was a distinct feature. At the western end of the small temples are the remains of vaults, showing that the altar stood, in each case, on a raised platform, forming what we should term a choir or sanctuary. The different arrangement here holds closely to the special difference between the Jewish worship and that of the contemporary people. Where no image was allowed, the concealment, by a veil, of the mystic Ark, from above which the oracle was uttered, was a necessity. But for the careful provisions of the law in that respect, the Ark, with its forms of life beaten in gold, would, in course of time, have become the visible symbol or *idolon* of the Jewish temple.

The care that was taken to prevent the slightest approach to any idolatrous declension of this nature was extreme. The oral law prescribed every action of the High Priest on the only occasion on which he was allowed to enter the *Sanctum Sanctorum*. Two veils hung, a cubit apart, between this portion of the temple and the outer part of the body of the building; at least, in the second temple. (In the first, there was only one veil.) The outer, or western veil, was so hung as to have its opening on the south; the inner veil, on the north. The High Priest took a handful of incense, and threw it on a piece of live charcoal, taken from the hearth of the altar and placed in a golden censer. With this burning, he entered the Temple, passed within the outer veil, passed between the two veils to the second opening, turned his face again to the south, and, with his eyes cast downwards, waved the censer till the *cella* was filled with the smoke. He then retired backwards from the Temple. The contrast between this reverent mode of symbolic worship, and the magnificent display of such an object of adoration as the great chryselephantine statues of the Greek temples, is absolute. It had, as we see, a structural expression.

Thus not only the rare, but undoubtedly authentic, Jewish coins to which we have referred, but the actual forms of temples yet extant in Syria, tend to confirm the simple and intelligible reading which we have ventured to offer of the long-disputed account of the early tabernacle. Mr. Fergusson has been strongly impressed with the unreasonable character of the ordinary opinion, which makes that venerable structure resemble a flat-topped box. His argument is derived from the unfitness of that shape for the discharge of rain or snow. It should be remembered, however, that not only most of the roofs to be seen in Syria are flat, occasionally varied, as in other Mediterranean countries, by the introduction of little domes, but that the actual black goatskin tents of the Arabs of the day are generally flat-topped; being for the most part formed of only a single sheet, bent to form a flat roof and one side. Still, the question of rainfall is one of much importance. So long as the idea of a ridged roof required the introduction of any structural elements which are not mentioned in the account, we felt bound to oppose it as unauthorised. In the drawing of the Tabernacle which is given in the work called "The Holy Sepulchre and the Temple at Jerusalem," reproduced from the Bible Dictionary, occur elements which are not only not mentioned in the Book of Exodus, but which are incompatible with that account; such as the central standard between the nave and the sanctuary. The entire form of the building is altered. Side-posts, lines, and verandahs are added, and the imagination of the artist has been allowed such play as to render the original account, from the new point of view, of no value whatever; as, unless it is complete, it is unreliable. But our present scheme, which is founded simply on the principle of investigating each detail, not according to the name given to it by St. Jerome, but from a workman's point of view, removes this objection; and we thus have at once a literal translation of the venerable passage, and not only an architectural possibility, but a carefully-adjusted and beautiful structure.

The measure of half the slope of the roof, on the proportion which we have indicated, is a little less than 6½ cubits. The embroidered veil would therefore have hung down on the outer gilded walls to within 2½ cubits, or 40 in., of the ground. The outer curtain of black goat's hair would fall 16 in. lower, or to within 2 ft. of the ground. We thus attain a correct structural equilibrium between the thrust of the roof and the additional weight imposed on the wall. If the curtains were so arranged that the joinings coincided, the central suture lying on the central rafters of the building, they would have hung down only to within 7 cubits of the ground on the western, or enclosed, side, and to within 3 cubits at the open end; this portion, moreover, being folded back when not required for protection from rain.

Whether the scarlet and purple sheep-skins covered the whole of the sloping roof, or the ridge alone, is not clear. In the latter case, a subdued light would have been transmitted through the embroidered veil. In the former case, the roof within would have been only lighted by the rays that entered from the east, and by the lustre of the golden candelabrum, two of the lamps of which were kept continually alight. The awe and silence of the place; the unwonted appearance of the three objects which it contained,—the lamp, the table, and the altar,—all of pure gold; the shimmer of the walls; and the rich hues of the embroidered roof, stretched out over the shining golden rafters; must have impressed the ministering priests with a deep sense of the mysterious solemnity of their worship. Thus regarded, the Tabernacle was not a makeshift, but a well-planned ecclesiastical structure,—portable, indeed, but complete and entire,—the outline of which is preserved to the present day by its repetition on Hebrew coins, and in Syrian temples.

* It would exceed our limits to enter into detailed comparison of each of the authorities, viz., Exodus xxvi., xxxvi., and xl., in the original, LXX, and Vulgate, and the 6th chapter of the third book of "Antiquities," in the Greek. St. Jerome says that the *vectes*, which we call rafters, *mittentur per medias tabulas, a summo usque ad summum*. Josephus says that there was one *phalanx*, or beam, into which the oblique ends of the *skutalides*, or *vectes*, from each side entered. The ordinary notion that these gilded bars were merely bolts to keep the fitted side-pieces of the building together, is inconsistent with these expressions. In each description the *phalanx* is spoken of as one, and in the middle. To convert this into two long bolts, one on each side, is contrary to the language used, as well as to any intelligent ideas of structure.

THE LATE MR. E. T. PARRIS.

DESCENDED from a family in Norfolk, the subject of this notice, Edmund Thomas Parris, was born in London, in the parish of Marylebone, on the 3rd of June, 1793. He early gave evidence of a taste for drawing and for mechanical pursuits, which he continued to cultivate through his long and energetic life. In his journal, minutely kept, he has recorded of himself that at the tender age of seven years old he made many copies from engravings from the Passions of Le Brun, from Macklin's Bible, West, and others which fell in his way. The early bias of the mind of the child, encouraged or disregarded, may often account for the success or failure in the life of the man. The father of young Parris, probably without any exact or lofty notions of art, had, however, carefully noted the predilection of his son, and sensibly determined to place the boy to some kind of business in which his pencil could be usefully applied; and, accordingly, at the usual age, he was apprenticed to Messrs. Ray & Montague to learn engine-turning, enamel-painting, and gold figure-chasing. Here he wrought through the day, and in his leisure hours at night cultivated that mingled love of science and art which never left him, and which, a few years later, developed itself in the invention of his scaffold for getting at the dome of St. Paul's, and in his great picture of the Panorama of London at the Coliseum in the Regent's Park.

In 1816 Parris bid farewell to the goldsmith's shop, but occasionally made designs for his late masters, one of his latest being the sword presented to Lord Exmouth, the gold ornaments of which he not only chased, but he painted all the enamelled subjects with which it was enriched, commemorative of the naval battle at the taking of Algiers. With growing experience and higher aims, he now sought to qualify himself for the life of a painter, and entered himself a student of the Royal Academy, and at the same period studied anatomy for three years under Dr. Carpue, meanwhile making designs for anything that came in his way. In a competition for a set of drawings for the painted glass windows at Brancepeth Castle, he carried off the prize, notwithstanding the accomplished Stothard had entered the lists. Ambitious of still greater things, in 1824 Mr. Parris exhibited his first large picture, "Christ Blessing little Children," displaying his ripening powers and academic culture. This work now adorns the east end of the church of St. George at Sheffield. He also invented about this period his remarkable apparatus for getting up into the dome of St. Paul's, with the view of being employed to restore the

paintings of Sir James Thornhill, which had fallen into decay, and submitted his model to the Dean and Chapter, Professor Cockerell, Brunel, and many other architects and scientific persons, who highly approved his plans; but, for the want of funds, the restoration was delayed. Amongst others, Mr. Thos. Horner, the projector of the great works at the Coliseum, was so struck with the simplicity of his invention, that he immediately entered into an engagement with Mr. Parris to assist him generally in his huge undertaking. Accordingly, on the 12th of December, 1825, Parris commenced that stupendous work, the Great Panorama of London, covering over 40,000 square feet of canvas, or nearly an acre in extent, and which, for the following four years, taxed all his mental and physical powers to their greatest stretch. The original sketches for this work were begun by Horner in 1821, during the time a new ball and cross were being set up over the dome of St. Paul's. They were drawn in outline by means of an optical apparatus on numerous pieces of paper, and a number of young men had been employed to sketch the details of the principal buildings about London without plan or system. These, when brought together, presented the utmost confusion and endless mistakes, and were like an ill-devised puzzle, the parts of which no dexterity could fit. "The difficulties [wrote Mr. Parris in his Journal] of an undertaking of such vast dimensions, and so full of linear and aërial perspective, combined with architecture, will be understood when it is stated that every line below the horizon had to be dipped downwards, in order to appear straight on account of the curvature of the canvas; the great size of some of the objects, and the most careful finishing of details (as powerful telescopes were to be fixed in the visitors' gallery),—also to make the foreground objects appear nearer the eye, though, in reality, more remote from the spectator, the distortions of drawing on a curved surface requiring every management of the artist to humour in order to *appear true*. The canvas, too, was always in motion, which the wind or leaning against any part would occasion all over. These with the danger and awkwardness of painting every day suspended in a box 50 ft. or 60 ft. from the ground, and a multitude of others unforeseen by the projector, and beyond his control, were every day retarding the progress of the painting, and I began to despair of ever seeing it brought to completion." "Mr. Horner at length became desperate, and, convinced of his own inability to conduct the work, implored me to take the whole management into my own hands, as the only way of saving him and the picture from ruin." An artist with less energy, skill, and constructive ability would have sunk under the ceaseless labour and perplexity he went through, in setting everything in order where nothing but disorder prevailed. His power of work was amazing, as the following from his Journal well illustrates:—"When Mr. Horner made his sketches from the top of St. Paul's, the ground on which the Post-office now stands was a blank space, enclosed with wooden palings. Consulting together, we thought it would be more interesting when the building should be partly finished, with some of the scaffolding standing, than if represented as finally complete. I therefore went to St. Paul's, and made the requisite sketches from the Golden Gallery, and finished it on the canvas, without assistance, in seventeen days. It is full of very intricate lines and effects, and occupies about 423 ft. superficial."

By unflinching determination and industry, Mr. Parris had completed about two-thirds of his work, when, in 1828, a fresh cause of embarrassment arose. Rowland Stephenson, the banker, through whom Horner obtained means to carry on his undertaking, fled the country, to be followed shortly by Horner himself, who absconded to America, leaving creditors to the amount of 60,000*l*. The Panorama, however, being so far advanced, the trustees for the creditors ordered its completion; and on November 29th, 1829, Mr. Parris put the last touch to his gigantic picture of London.

At the termination of his labours, Mr. Parris, by command of Queen Adelaide, attended at the Coliseum to receive Her Majesty, and at the same time was honoured by a commission for a cabinet picture. At this period of his life, it appeared as though no amount of toil could subdue his active temperament; for scarcely had he concluded his arduous task at the Coliseum, and the town was still ringing with admiration at his great and well-merited success, when he joined in another large undertaking with Mr. Daniels, R.A., to paint a panorama of Madras, the building for the exhibition of which Mr. Parris wholly designed and constructed.

He had now established an uncommon reputation as an accomplished artist, and man of ready mechanical expedients, with quickness and acuteness in combining ideas, on an enormous scale: it was now (1832) that he displayed an equal capacity for small and highly finished work in "The Bridemaid," exhibited at the British Institution, perhaps the most felicitous of a number of pictures of this class which he produced in a succession of years, as it was undoubtedly the most popular. Purchased by the great minister, Sir Robert Peel, praised by the critics, complimented by verses from the pen of Miss Agnes Strickland, and of Haynes Bailey, mezzotinted by Bromley, it long retained the admiration of the public, and established the artist's reputation as a painter of female beauty. The demand on his time was now excessive, for numerous portraits of noble and distinguished persons; ceiling work for the Duke of Sutherland; designs for church windows; for ornamental silver, for carpets, for paperings, for illustrated books, screens, and all kinds of decorative work. It is perhaps to be regretted that he engaged in so great a diversity of things, as many of them could only serve the fashion of the hour, and draw him from more elevated occupations. For the coronation of William IV., Mr. Parris painted the architectural screen set up before the organ-loft, and other ornamental works, in the Abbey, for Mr. S. Smirke; and soon afterwards finished the picture commissioned by Queen Adelaide, entitled the "Warrior's Wife," with which her Majesty was so well pleased, that unsolicited Mr. Parris received the appointment of "Historical Painter to the Queen." He now entered largely into decorative painting for which his ready pencil and previous practice eminently fitted him. He executed the arabesques at Northumberland House; the Watteau panels for the saloon of the *Great Western* steam-ship, the first that steamed across the Atlantic; and subsequently the palatial residences of the Duke of St. Alban's, Lord Prudhoe, Lord Downshire, Earl de Grey, Marquis of Lansdowne, Sir Roger Palmer's, in Portland-place, and many others: at this last the Prince Consort honoured the painter by calling to see his work.

In 1838, Mr. Parris undertook to paint for Mr. Moon, the print publisher, a large picture for engraving of the Coronation of Queen Victoria, and remained all one night in the Abbey making preparatory sketches. Seventy members of the nobility sat to him, and Her Majesty honoured the painter with a sitting for her portrait to complete the work.

In 1843, he carried off one of the first prizes in the Cartoon Competition for the Houses of Parliament, and also exhibited a large Fresco of "King John in Westminster Hall"; and on the recommendation of Lord Prudhoe was invited to paint the Palace of Mehemet Ali at Alexandria, in fresco. He was also invited by Prince Kochebee to paint his Palace at St. Petersburg; but both these offers were declined. The question of the restoration of Thornhill's pictures in the interior of the Dome of St. Paul's was again revived in 1852-3, on this occasion to be brought to a conclusion. In March, 1853, Mr. Parris commenced his platform—"the first pole of which was raised to the great cornice and fixed in its place," and in about three weeks the whole of his ingenious plan of getting at the interior of the dome was constructed, and the restoration of the pictures commenced in July. "The whole surface painted contained about 1,800 square feet. The figures are nearly 16 ft. high, the vases 10 ft. The cornice where the painting begins is 160 ft. from the pavement; the eye of gallery at top of dome, 220 ft. Suspended at this terrific height through winter and summer he continued his arduous employment for a little over three years and a half, and finished it in July, 1856, without a single accident having occurred during the whole period, though no less than five hundred visitors had at different times ascended to the artist's platform, in addition to the necessary labourers employed,—a practical proof of the singular skill and admirable manner in which all his plans were executed. Of this structure some accounts appeared in the *Builder* for June, 1853. In 1864, he constructed a full-sized model of Shakspeare's House for the Crystal Palace Company at Sydenham; and in 1866 his facile pencil was engaged to prepare a model for a piece of tapestry, 40 ft. long, for the Paris Exhibition: the subject, Christ and the Apostles, after the statues of Thorwaldsen; and so he continued to the end, ever working: nothing came amiss to him, great or small,—he pursued it with untiring zeal. It was, indeed, impossible, with a mind so active and a hand so ready, ever to be idle. Self-reliant, he carried his inventions into practice without fear; and in painting essayed almost every form and branch of the art. With a versatility so pronounced, he could hardly be expected to achieve success in all, yet he was successful in many, and will be remembered by those who knew him, not only as a man of great general ability, but also for his kindly and happy bearing.

It is customary to express regret at the loss of those who have distinguished themselves in this world. Relatives and friends naturally mourn the departure of those to whom they have been long attached, but it may afford hope and consolation to many to know that the late Mr. Parris passed his long life in the happy enjoyment of intellectual labour, honoured by the world, and respected by troops of friends; and who, having done his work well, paid the common lot of humanity, without suffering, at the advanced age of eighty-two years.

J. J. J.

ON ARTS AND ARTISTS.

AT the annual meeting of the Gloucester School of Art, fully noticed in the local *Chronicle*, Mr. Gambier Parry made, as on some previous occasions, a long and interesting address. On this occasion, he said, he thought it most appropriate to take a general view of their standing in fine arts, both nationally and as regarded their own school. If he went back to the Middle Ages, it would be only for a few minutes, because he wished them to know or to learn what arts prevailed in the Middle Ages in England, and particularly at Gloucester. In a country so small as our own island, and when it was smaller still for all available purposes by being, even as late as the reign of Edward II., about two-thirds covered with wild forest or desolate moor, and when Scotland and Ireland were but half-civilised neighbours,—a hindrance by their barbarism and a trouble by their wars,—they must not expect to find works of art of the size and imposing grandeur of those to be found in great Continental nations, or of a small one like Italy, with the gigantic wealth of Rome, and a climate and a soil exceptional in this world; but it was notorious that some forms of art in this country excelled those of other nations in their quality. Such, for instance, was the development of the purest forms of Gothic architecture at the end of the thirteenth and beginning of the fourteenth centuries, and the singular excellence of its details. English architecture of that time was surpassed nowhere, and, not to mention more than two instances, he would refer them to the little chapter-room in York Minster, on the walls of which there was this beautiful motto:—

"*Ut rosa flos florum, sic domus ista domorum.*"

"As is the rose the flower of flowers, so of houses this is of ours."

This was the brightest idea ever wrought round a building. The other was the Lady Chapel at Ely, which, although it had been knocked to pieces by the Puritans, its sculpture was still unsurpassed. The mechanical genius of Englishmen had usually been more apparent than any lofty artistic inspiration. Hence this result in our architectural work, but for that we had exhibited to the world men of highest genius, from the days of Alan de Walsingham and William de Wyckham to those of Sir Christopher Wren. Some of the most striking anecdotes had been told of the men of those times, such as that relating to old Prior Goldstone, of Canterbury, in the fourteenth century, who had every scrap of carved stone brought into his study, where he kept a little anvil and hammer, and broke up every piece that was not up to his standard of excellence. Then, again, at Gloucester, there was the excellent old Abbot Wigmore, who did much the same, and had every piece of stone and carving used for building Gloucester Cathedral brought to him, and condemned to be broken up every bit that, as he said, was not good enough for Wigmore. This Abbot Wigmore was a very remarkable man. He established the first School of Art in Glou-

cester, and worked in it himself in every grade. He was a great artist, a designer, a skilful architect, and moreover he was even an embroiderer; and in an old MS. of the biography of the abbots of Gloucester, preserved in one of the colleges at Oxford, it was recorded that Wigmore designed and embroidered with his own hands silver doves on a green satin cope for the office of the Pentecost. Wigmore was not only a man for small things, but he was a great collector of works of art, and the first account we had of any portrait-gallery of Englishmen was that possessed at Gloucester by Abbot Wigmore, who had in his rooms portraits of all the kings of England before his own time, and his time was that of Edward II. The embroidery in which Wigmore was so great a proficient was a most famous art in England, so much so that the work was valued at an immense price all over Europe. There was no doubt that painting and illumination were arts in which Englishmen used to excel exceedingly. If they went to the cloisters at Gloucester, and turned sharp to the left, when they went down the steps they would see a number of little recesses wherein were seats on which a monk could sit, with the light on his left hand, and with his desk before him; and his notion was that those were the places in which the monks used to write their books and illuminated manuscripts, and where perhaps old Wigmore embroidered his doves. He now came a little nearer to our own times,—the days of Henry VII., which formed the era of the greatest amount of building in this country since the thirteenth century, and which were only equalled by the building activity of our own times. But the best of English art seemed to have died out as architecture degenerated, and we heard only of foreigners. They all knew the everlasting pictures of Henry VIII.; but no Englishman ever painted him. Indeed, if it were not too much of a joke, they might suppose that Henry VIII.'s tremendous fatness was caused by his always sitting for his portrait; he must have taken a great deal of what an Irishman called sedentary exercise. From his time things went on just as bad as ever, for in another MS., quoted by an authority on art, there was a curious statement made by the writer as to the condition of English art in the time of Henry VIII. In his time there were two men of very remarkable talent indeed,—Bossom and Hilliard,—illuminators and miniature portrait-painters. The document to which he had referred said:—"Alas! if a man be so induced by nature, and live in time of trouble, and under a Government wherein arts be not esteemed, and himself but of small means, woe be to him! as unto an untimely birth, for of my own knowledge art hath made poor men poorer;" and such were John Bossom and Michael Hilliard, who were only unfortunate in art because they were English born. They heard of Holbein and many Flemish and Italian artists, but at that date few names of Englishmen were known, except inferior workers of decoration in Henry VII.'s Chapel, and there were some sad records in anonymous MS. at the end of Henry VIII.'s reign in reference to the treatment of poor English artists. They must wander on over many years before finding any English names of eminence; Flemish and Italians were still the only men in repute, and from Sir Antonio More, through the days of Rubens, Hilliard, and Vandyck, to those of Kneller and Lely, they heard of no one but such as Betts, and Shoote, painter and illuminator, of the time of Elizabeth, and a distinguished amateur, Edward Courtnay, Earl of Devon, of the same period, and Dr. Garrord, whose name sounded like English, but who became naturalised here, and designed for engraving, glass-painting, and other arts. He was born in Bruges, but died in England in 1635. Michael Hilliard, who died in 1619, was one of the earliest-known English artists who really acquired fame for his great merits. He painted a great many portraits of Queen Elizabeth, which were now much valued. He was a genius, and, at the age of thirteen, painted his own portrait; besides which he designed and worked in gold, jewelry, sculpture, and illumination. Indeed, the poor fellow's powers were so great that it would be hardly an exaggeration to call him our Early English edition of Leonardo da Vinci, for he seemed to have known and done everything; but James I., who would have been very glad to be considered our Lorenzo de Medici, allowed poor Hilliard to live in poverty and to die in trouble. Next after him came Isaac Oliver, whose works were invaluable, because from his miniatures could be seen the faces of Mary Queen of Scots, Queen Elizabeth, Ben Jonson, Sir Philip Sydney, and James I. His works were described as being of wonderful execution, minute and powerful in expression, and perfect in nature. Sacred subjects he failed in; but the "Entombment," and copies in miniature of great pictures in the collection of Charles I., and also a few portraits, originals and copies in oil, were known to have been by him. There were others whose names at this time were hardly worth mentioning, but there were engravers such as Cute, and painters such as Pyne and Cole, whose works might now be dragging the weary folds of their canvas in rotting frames in far-off farmhouses or remote parsonages, where their traditions were invaluable, and where the ignorance of the public was to blame in neglecting the remnants of English art. One of the most remarkable names in English history was that of Bacon. Not only was there the great Sir Francis Bacon, Lord Chancellor and Keeper of the Seals to Queen Elizabeth, but there was a Sir Roger Bacon in the thirteenth century, who was so great a man as to have invented or nearly completed the telescope and the camera obscura, so that if he had lived now he would most decidedly have been an artist. But he invented another thing, and that was gunpowder, which he (Mr. Parry) was afraid was very little in keeping with the arts. He was a most wonderful man, and was the suggester of the first great Church Reformation which took place in the thirteenth century. Next, they came to Sir Francis Bacon (Lord Verulam), the great philosopher, and then to Sir Nathaniel Bacon, half-brother of the philosopher. He was one of the greatest artists of his day; but he was an amateur. Within 100 years of the present time there was another Bacon, who was a great designer of china, at Worcester and Burslem. In the time of Elizabeth there were some very distinguished architects. The principal ones were John Thorpe and Skillington, and amongst the houses built by Thorpe were Burleigh, Holland House, Castle Ashby, and Charlton, in Wiltshire. From that time English art began in earnest, and the leading names of the period were those of Peter Oliver, the great historical portrait-painter; Oliver Isaac, the elder, a glass-painter; and John, the younger, a master mason and a great carver. It was remarkable how genius and art ran in families. Next they came to William Dobson, whom King Charles used to call the English Tintoretto. He was a fine painter of portraits in oils, and succeeded Vandyck as painter to the king. Among his pictures which were valuable, as giving a good idea of those he painted, were a portrait of Prince Rupert and Sir Thomas Browne, author of "Religio Medici." Still, in spite of the fact that there were such men in this country, the persons supported and patronised were none others but Dutch, French, Flemish, and Italian artists. Amongst them was Coker, who painted Colonel Massey, a name known to every Gloucester man, and whose picture was now in Cheshire. Another man of whom they all knew was Samuel Butler, the author of "Hudibras." He was one of the greatest amateurs of the period in painting and music; but his works appeared to have shared a sad fate; for it was said of some of them that on a tax being levied on windows, several of Sir Samuel Butler's pictures were used to stop up the windows and save the tax. That was recorded in Nash's "History of Worcestershire." Among the first painters of their day were Anthony, Harrison, &c., until we came to Inigo Jones, and then it was we saw how English art was patronised. Even foreigners spoke of English artists, and were surprised that they should have been so much neglected. Inigo Jones, who was born in 1572, and died in 1652, rose to the highest estimation in England and on the Continent. He mentioned that as an encouragement to the young men in the wagon works and the carpenters' shops of Gloucester. His father was engaged in a business in which Gloucestershire especially excels. He was a cloth-weaver, and Inigo himself was apprenticed to a carpenter; but the young fellow, in his quiet moments, amused himself in art-study, little knowing how much he was going to do. His heart, instead of being in the carpenter's shop, was out of doors, and he would wander in the fields, his delight being in landscape-painting. He went to Italy to study painting, but came back an architect, and was the designer of Whitehall Chapel, the Banqueting-house, and Palace. Jones got into the high estimation of King James, who set him to find out a query, viz., what Stonehenge was,—a wonderful mystery in those days; and Inigo, after considering the matter a long time, came to the conclusion that Stonehenge must be the remains of a Roman temple! His attempts at St. Paul's were not very grand, though he did a great many good works; but, alas! for poor Inigo, he was ruined by the fall of Charles I., his goods were sequestrated, and, more sad still, his monument was destroyed in the Fire of London. Dryden wrote three lines worthy of being his epitaph:—

"Firm Doric pillars found your solid base;
The fair Corinthian crowns the higher space.
Thus all below is strength and all above is grace."

A most perfect epitaph for poor Inigo's tomb! Still, foreign painters were the favourites in England, the Mytens' and other Flemish pictures being all the rage. In Cromwell's time, a man named Robert Walker was a famous portrait-painter, and was largely patronised by Cromwell, whose portrait he frequently painted, and if ever they saw a fine portrait of Cromwell they might be sure it was either painted by or copied from Walker. Two other famous painters at about this time were Francis Carter, chief clerk to Inigo Jones, and one Heywood, who painted portraits of Fairfax. Coming on to the period of the Restoration, they found a celebrated miniature-painter, Samuel Cooper, who was born in 1609 and died in May, 1672. He was the first to give the force of oil to water-painting, and he also executed portraits of Cromwell. He must also mention a famous lady named Mary Beal, a pupil of Lely, who died in 1697; and then they came to a man whom they all knew something about, the famous Grinling Gibbons, a sculptor and carver in wood, born 1648, died August 3rd, 1721. His work was unsurpassable, and was greatly admired. And now they came face to face with Sir Christopher Wren,—a great man indeed, and the first artist who seemed to have engaged the concentrated attention of Englishmen. They *did* value him, but even he died in sadness, and almost of a broken heart. He was a mathematician, an astronomer, and an architect. Of his works he need say nothing, but do not let them suppose that all the finest churches in London said to be Wren's were built by him. He built a great many churches, but there were other great men at about his time who built churches, and amongst them he mentioned Gibbs, who built St. Martin's with its fine colonnade, and no one could go past Charing Cross and down towards the Strand without being struck by the exceeding beauty of St. Martin's colonnade. He also built St. Mary's in the Strand. They next came to a number of architects, and amongst them was Sir J. Vanbrugh, who designed Castle Howard and Blenheim Palace, but did not succeed. He died in 1726. At about this time another art struck root in this country, and it was a very remarkable one, English landscape gardening; though our scenery was sweet and pretty in its way, there was wanting feature in it. William Kent, born 1684, and died 1740, was a painter, sculptor, and architect, and was also the father of landscape gardening in England. The great Prince Rupert, son of the Princess Elizabeth of England and Queen of Bohemia, after all his troubles and all his wars, settled in Paris, and occupied himself with the fine arts, and invented mezzotinto engraving. Coming still nearer to our own times, they met with Sir William Chambers, architect of Somerset House; and then came the Adamses, John and Robert, architects, who built that part of London known as the Adelphi, which, in Greek, meant brothers, and for which reason it was called the Adelphi. And now they came to a time when English art broke forth in real earnest, and began to be appreciated. He could not say that the man he was about to speak of was a great artist, but he was a great man in his way, because at that time so little encouragement was offered to architects. He referred to Sir James Thornhill, who was brought up in a quiet parsonage, and taught himself. He went to Italy, and came back full of the Italian school of the time—not a very good one—and was employed in painting the interior of the cupola of St. Paul's, and the Great Hall at Greenwich; but while the Italian painters were receiving their thousands of pounds, and Frenchmen their 500*l.* and 600*l.* for painting one room, Thornhill, who was really a great painter, was depreciated and treated in a most shabby manner. When he sent in his moderate bill for the great work to which he (Mr. Parry) had alluded, it was returned, and when the question of payment was submitted to Parliament, they said "Oh, you had better pay him by the yard!" and he actually received

for his gigantic work the sum of 40s. per yard. Thornhill was born in 1676, and died on the 4th May, 1734. The poor English artist never could come to the front simply because he was English. However, at this period things began to look brighter, and Sir Joshua Reynolds, pupil of another great man, Thomas Hudson, the portrait-painter, came upon the scene. He was born in 1723, and, after working a great deal by himself, he went to the Vatican to copy and study the greatest masters there, particularly Raffaelle and Michelangelo. With him arose Gainsborough, who was born in 1727, and was entirely untaught. It was said of him that Nature was his teacher, and that the woods of Suffolk were his academy,—a pretty little description of him which was perfectly true. These two men were the great men of their day, and then it was that art and the merits of English artists began to be rightly appreciated. But he must now leave the portrait and landscape painters, and refer to another most remarkable and beautiful art,—the art of porcelain. He did not know if they were aware of how many establishments there were in England for the artistic manufacture of porcelain: they were too numerous to mention, and were scattered all over the country. The principal manufactories were at Worcester, Liverpool, Chelsea, and Battersea, besides which there was the great Wedgwood at Burslem. Those establishments showed how much at that time art was being appreciated; but if Reynolds, Gainsborough, and Hudson had not commanded the English taste, he doubted if the porcelain works would have succeeded as they had done. As long ago as 1751 the remarkable invention of printing in copper-plate on china was discovered,—a most simple and ingenious discovery, but one which revolutionised the art of ornamental pottery, bringing the brightest things into the humblest cottage, and enabling the poorest man to have ornaments which should be to him a joy for ever. Having described the mode in which this ornamental work was done, Mr. Parry thus concluded his address:—"If any one would ask what are these fine arts, whence did they come, and why do they exist, I can only reply, firmly, that their motive power is in that spark of life divine which is our soul, and which, conscious of its own power, conscious of its own eternity, and conscious, too, of its temporary imprisonment within the narrow limits of the human breast, is ever seeking the means of its own expression to communicate and to attract the sympathy of others. And what is the purpose that it has to tell but its hatred for all that is earthly, its love for all that is lovely, good, beautiful, and true, and to tell that tale to others? If the words of common language will not suffice, it creates for its own purpose that finer and more subtle language which we call art. For this it takes the forms, the features, the sounds, and the characters of the material world, in which to embody and to express its idea. These, indeed, may be poor materials for so high a purpose; but it is all that is at hand. The spirit is within us all; it is the source and centre of our individual life and character. Some men are conscious of it; some men are not; and hence the varying tastes and habits of those around us. Some men have choked that spark of life, and closed up its avenues to the light by heaping around themselves the things of earthly and sensuous vanity. Others, more free and open to the light, are sensible of an energy within them which impels them to action and expression. They seek to clothe their thoughts in the beauty of words, or sounds, or of material things. The whole world is open to them, and whether it be in the beauty of literature or art, in the beauty of reason or science, in the beauty of moral life or material expression, they attain what they most long for, viz., the expression of their own fulness and the sympathy of others. Such purpose, such impulse, has been the motive of the poets, the sculptors, the artists of the world,—men whose names outlive their works, because their works have been the joy of the world, and joy will always outlive sorrow, and truth will always outlive falsity. The arts have had a long history. They live among us now; not, indeed, in their old vigour, but at least with an evidence of reviving force. If ever the old vigour is to be revived, if ever the great and good of fine art is to be reproduced in its future, it can only be by the same means, learnt by equal devotion, and perfected by an equal freedom from self-consciousness and conceit; and if it is ever again (as it was in former days) to be the glory of those who produce and the joy of those who receive it, it can only be by its purity and its beauty and its truthfulness, the secret of that 'touch of nature which makes the whole world kin.'"

HASTINGS AQUARIUM COMPETITION.

The first premium has been awarded to Mr. E. A. Heffer, for the design marked *Nunc aut Nunquam*," favourably noticed in our review of the competition. Mr. Heffer is best known by the Church of St. Bridget, Wavertree, Liverpool, fully illustrated some time ago in the *Builder*.

Mr. Card, to whom six of the designs sent in were referred, said in his report,—

"The authors of the designs bearing the mottoes 'Victor,' 'Neptune B,' and 'Alpha,' not having complied with the requirements proposed, or having failed to carry out the purposes suggested, or whose designs are not desirable to be considered. Those authors whose designs bear the mottoes of 'Stability,' 'Murus Maritimus,' and 'Nunc aut Nunquam,' appear such as merit the greatest commendation, and, in forming my opinion on these three designs, I have carefully weighed the various objections to each, and taking into consideration the main features of your requirements, together with the greatest benefits and advantages which would be secured by the adoption of any design, I consider that the author of 'Nunc aut Nunquam' has most fairly complied with the purpose intended, although, at the same time, it would be unwise that this or either design submitted should be carried out in its entirety without certain modifications affecting the parade, and also the widening of roadway.

In conclusion, it appears to me not only to be a matter of regret that the council did not offer a second, or even a third, premium; but that they did not also lay down a more distinct and definite plan for the competitors to proceed upon, and that too much has been therefore left to their ideas: thus rendering it a matter of considerable difficulty to arrive at the conclusion I have done."

After some discussion, the Town Council voted the sum of 50*l.* each to the authors of the designs marked "*Murus Maritimus*," and "Stability"; the authors of which are, respectively, Messrs. Wm. T. & Alfred Cross & Arthur Wells, of 53, Charing-cross, London, and Bohemia-road, Hastings; and Messrs. Jeffery & Skiller, of Havelock-road, Hastings. The awarded designs are to become the property of the council.

THE PROPOSED BATHS AND WASH-HOUSES IN SOUTHWARK AND THE LOCAL GOVERNMENT BOARD.

A few weeks ago we drew attention to an effort which was being made on the part of the parish of St. George the Martyr for the erection of baths and washhouses in Southwark, and that with the view of carrying out this object they had applied to the Local Government Board for the sum of 12,700*l.* belonging to the parish, and invested in Consols, being the proceeds of certain parochial property at Mitcham, which was sold as being no longer necessary when St. George's parish was united with St. Saviour's Union. The Local Government Board had promised that they would consent to the application of the above-named amount for the establishment of any institution or works of a permanent character for the benefit of the inhabitants. And the St. George's authorities, thinking that the erection of public baths and washhouses would confer a benefit on the inhabitants, applied for the amount accordingly. The reply of the Local Government Board, however, which has just been received, is unfavourable; and it would appear from it that the large amount now invested in Consols is likely to be invested in the building of extended workhouse accommodation in the St. Saviour's Union. The Board in their reply state that the St. Saviour's guardians have just agreed to purchase the freehold of the site of St. Saviour's Workhouse; and that they propose to erect new buildings upon a portion of it, in addition to which the contemplated alterations involve also an enlargement of the Newington Workhouse. The Board therefore state that, in expectation of the probable demands upon the parish of St. George the Martyr in reference to the new works, it is not advisable that the investment should be disturbed in respect of any other contemplated building. This communication has given rise to much dissatisfaction in St. George's parish, the inhabitants of which are warmly in favour of the erection of baths and washhouses, in order to promote the health and sanitary condition of the district. They urge that the Union has already three large workhouses, in addition to which a spacious infirmary has just been built at a large cost, and that the workhouses are ample and large enough for the requirements of the Union. The inhabitants of St. George's appear desirous that the large sum belonging to them shall be expended in the erection of baths and washhouses rather than in building unnecessary new workhouses, and we understand that a public meeting is about to be held on the subject.

BUILDING CONTRIVANCES AND MATERIALS AT NEXT INTERNATIONAL EXHIBITION.

We wish specially to direct our readers' attention to an advertisement from her Majesty's Commissioners as to the department of architecture, building contrivances, and materials, including cements, concretes, and plaster, in order that they may be induced to assist in forming an adequate representation of the section. A meeting of the sub-committee to whom it is intrusted, was held on Wednesday, the 10th inst., at Gore Lodge, Col. Gallwey, R.E., in the chair, when Colonel Wray, Major Du Cane, Mr. Grissell, Mr. George Dines, Mr. T. Roger Smith, Mr. Grant, Mr. Kirkaldy, Mr. Godwin, and others, also attended. It was determined, amongst other things, that facilities should be afforded exhibitors for testing new materials and processes. It was much desired that foreign materials and modes of construction should be well represented, and it was hoped that the foreign commissioners, through whom everything from abroad must necessarily come, would take steps to make this desire known. From France much that is valuable might be sent. If M. César Daly, M. Adolphe Lance, or M. Charles Lucas, for example, would move in it, most interesting means of comparing the building appliances and modes used in the two countries would doubtless be obtained.

Intending exhibitors at home should send notice at once.

NEW PUBLIC HALLS FOR GLASGOW.

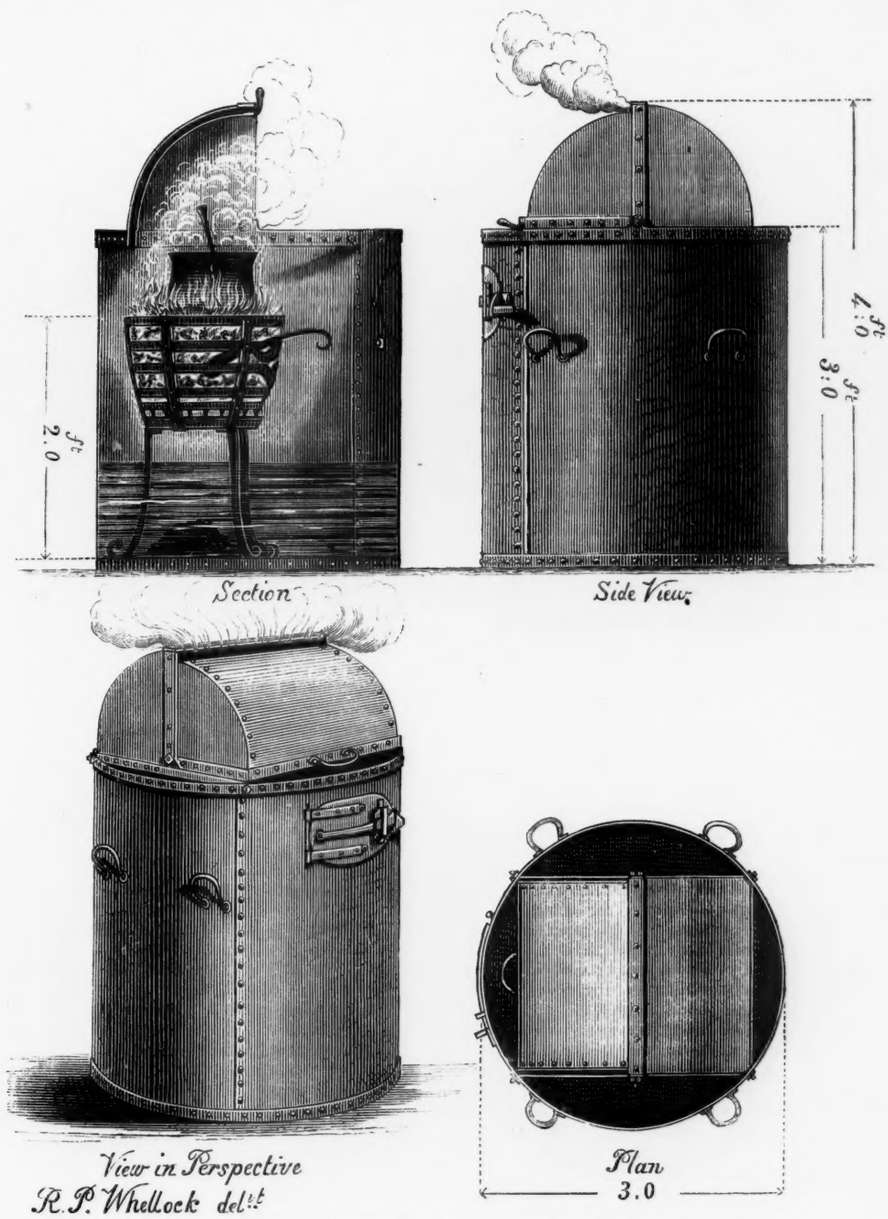
The inadequate accommodation, inconvenient situation, and defective acoustical properties of the Glasgow City Hall have been rendered painfully apparent of late owing to the occurrence of the musical festival and the visit of Mr. Disraeli. There have long been loud complaints as to the want of new and commodious public halls to meet the wants of a large city like this, and it is satisfactory to learn that those wants are likely to be soon supplied. It is proposed to erect new public halls on a plot of ground having a frontage of about 200 ft. to Granville-street and 160 ft. to Berkeley-street and Kent-road, thus occupying over 3,500 square yards of building-ground. The main entrance from Granville-street will be upon the principal floor. The great hall, which will be 75 ft. wide and 140 ft. long, will be reached through a vestibule, and then through an octagonal hall, 36 ft. in diameter. To be added to the above dimensions of the great hall is the recess for the organ and the north gallery, which will make a total length of 186 ft. The galleries will accommodate about 650 persons. A provision will be made in front of the organ for a large orchestra and chorus, which is of great importance in a place intended for large meetings. There will be six exits from the great hall. All those minor adjuncts which render the accommodation of such a place complete will be considered.

The great hall of the new building will contain 15,565 ft. of floorage, and will seat 2,920 persons, and, when packed, will hold many more. The actual capital required to complete the new undertaking will be 80,000*l.*, nearly 60,000*l.* of which have been already subscribed. Sir Michael Costa, who has examined the plans, has expressed his satisfaction with them from a musician's point of view. The late Mr. Cunningham, of Liverpool, architect, in conjunction with Mr. Campbell Douglas, of Glasgow, planned the new buildings.

THE LAW COURTS.

Messrs. Bull & Sons will commence the erection of the new Law Courts on the 5th of January next, being the first Monday in the new year.

Society of Arts.—On Wednesday evening last a paper on Mechanical Processes for producing Decorative Designs on Wood, by Mr. Thomas Whitburn, was read. We will return to it in our next.



THE PLUMBERS' FIRE-SAFEGUARD.

THE PLUMBERS' FIRE-SAFEGUARD.

THE calamitous fires by which a considerable part of Canterbury Cathedral and, still later, the Alexandra Palace, with all, or nearly all, its valuable contents, were destroyed, having been traced out to the fire-basket of the plumbers engaged in repairing the roof, from which, it is supposed, some live coals or molten metal had escaped and ignited the nearest inflammable materials, attention has been drawn to the means of preventing such disasters in future.

Mr. F. C. Penrose, the architect to St. Paul's Cathedral, having given the matter his consideration, with some valuable aid from Mr. Shand, of the firm of Shand & Mason, of Southwark, engineers, has just perfected a useful and simple invention for the protection of the plumbers' cresset or fire-basket, and which is now in actual use by the plumbers engaged in the repairs of the roof of the cathedral, and is found to answer very satisfactorily. We have given in the present page a wood-cut of it, made from sketches on the spot, and which, with the following description, will be readily understood.

It consists of a cylinder of galvanised wrought iron, made of boiler plate $\frac{1}{10}$ in. thick and 3 ft. high by 2 ft. $8\frac{3}{4}$ in. diameter; above is a cowl or hood, the one-half of which, being fixed to the centre, is movable,—*i.e.*, may be raised or lowered at pleasure, for the purpose of getting at the melting-pot. The head is square or oblong on plan, and semicircular in elevation, the two halves being concentric with each other; they are each strengthened with a framework of iron bars, of thin gauge,—in other words, formed of strap-iron, $1\frac{3}{8}$ in. by $\frac{3}{8}$ in. thick, secured to the sides of the cylinder with nuts and screws. The cowl is thus made removable for the purpose of inserting and withdrawing the cresset inside the cylinder.

When the fire-basket is fixed, water having been previously poured into the latter to the depth of about one-third of its height, the fire is lighted, the metal-pot put on, the bulbs or irons inserted between the bars, a small door being provided for getting access more readily to the fire, and which is afterwards carefully shut. When the cowl is closed, a long aperture is left of about $1\frac{1}{2}$ in. in width for the escape of the smoke.

The plan shows the sides of a segmental form, open to the atmosphere, which are purposely left for the supply of air to the fire.

The whole thing is made portable for two men, for whose use handles are provided at the sides. The enclosure, apart from the fire-basket, weighs about $1\frac{1}{2}$ cwt. to 2 cwt., but may be made considerably lighter, if requisite, by reducing the size in height and diameter about 3 in. each dimension,—but no more.

Messrs. Shand & Mason, of Upper Ground-street, Blackfriars-road, engineers, made it, and are prepared to supply them to the trade for 10*l.* each.

It answers to the full satisfaction of the plumbers now engaged with it, and, moreover, it effects a saving of at least one-third of the fuel as used under the old unprotected plan.

PROFESSOR MAX MÜLLER AND "RELIGION" IN ARCHITECTURE.

IT is most curious to note how the *past*, every now and then, starts up and makes itself visible to the *present*. If the world of to-day had nought but itself and its own thoughts to go by, it would make, it is to be feared, but a sorry figure. It is by recollections and by borrowings from the past of human experiences that the poetry of the present is made up, and perhaps its mental happiness assured. This is an old thought, but it may strike some, it may be, for the first time; for in the daily familiarity of things their *beginnings* do not press themselves on common notice. To cite an example,—architecture, what would it be without "precedent" to go by? If the past of architecture were utterly blotted out, what would the present of it be like? A curious question enough. Church architecture, again, as nowadays practised, whether in or out of the "Establishment," is but little more at any time than a careful copying, or a following of the

past of church and chapel building, both in arrangement and in details. So much are we at the mercy of those who have preceded us. If these or some such thoughts have not struck many before now, they can hardly fail to do so after the remarkable, and certainly exceptional, "evening lecture" of Professor Max Müller, in the nave of Westminster Abbey. It was about the past and the origin of the primitive religions of the world,—of those religions, and feelings, and intellectual systems which gave birth to the great architectures of the past, to which we moderns nowadays refer so industriously, and make such efforts to imitate and rival.

In this right glorious and tight little island we are so accustomed to a steady and even routine, that it becomes not a little difficult to realise to ourselves anything very different from it. It is to us the whole world in miniature. But if we go back in time, and cease to think of the present, and look at things as they once existed, and had form and movement and meaning, we must soon see how very wide a world it is we live in, and how very many are the thoughts and ways of it; and how diverse the thoughts of this world have been, for the very poles of the world are not wider apart than have been the religious expressions of it, and the architectural thoughts which have grown out of, and enshrined them. Take old Egypt, for instance,—of which, by the bye, the learned Professor said nothing,—what a strange faith and architecture. In the "science," of which the Professor speaks, it is a little difficult to say whereabouts the faith of Egypt would range itself. To the common people it must have presented a gorgeous show, as the magnificent sculptures prove; and to the "learned of the Egyptians" it must have embodied some truly grand ideas, else could the architecture never have risen to the height it did. Building was a reality, and the builder meant all he did. If the building was large and colossal then we may be sure that the feelings and motives of those who built it up, stone by stone, were large and colossal also. To this hour there does not exist on the earth's surface so *grand* a structure as Karnac, with its multitude of courts and its columned hall,—written on within and without. It is not a little strange, too, that the earthly habitations of these people should all of them have utterly perished, and passed away, while their "Temples," devoted to "dreamings," and their "sepulchres" to hold their dead bodies, should have lasted to this hour. Nowhere do we possess so complete a record of an antique faith, and of that which enshrined it, as we do in the ruined temples of Egypt; and from the sculptures, accurately realistic as they are, to say nothing of the hieroglyphic writing: it may be in the future that a complete idea of the religion of this ancient people may be got at, and the foundational ideas on which it was based, and out of which the architecture grew. Architecture and sculpture, fine art that is, were prime necessities, the outward forms could not but exist. A noteworthy fact for the thoughtful in these matters. Another phase of faith, the very opposite of this, and specially referred to by Professor Max Müller in his interesting lecture, the *Jewish*, was remarkable in the world's history, as altogether rejecting a multiplicity of temples, but demanding, as a prime necessity, *one* temple, and one only; round which the whole nation was to cluster, and which, indeed, was to hold the whole people together. We are speaking, of course, of a time before the idea of "synagogue" became a necessity. There has been, perhaps strangely, no Jewish architecture, no style of art, which can be said to have been peculiarly the invention of the Jew, and useful to him, and to him only. It would have been not a little curious to have seen this "order" of architecture. The word poetry of the Jew being what it is, the poetry in stone must surely in some strange way or other, have corresponded to it, and been worthy to enshrine it. A wonderful idea if only in thought. The magnificent "prophecies" of Israel were not uttered within houses made with hands.

We cannot, of course, follow Professor Müller into all the eight "historical languages" or utterances of the faith of mankind, from the beginning of the world to the present day, and under which headings he has catalogued the world's religions, and under which he might have almost added the world's corresponding architecture; but we may yet say a word more on one or two of them. We have named two opposite ideas,—the one needing temples everywhere, the other needing but one. The Egyptian, there can be but small doubt, invented everything for himself, or, rather, what he needed grew out of himself, unborrowed. The Bible shows how the Jewish faith came into being; but the architecture was always, as it now is, borrowed from the country wherein the "chosen people" happened to abide at the time.

It may be interesting here to note that, before,—long before,—the birth of the Jewish faith, and before the Egyptian could have symbolised his strange ideas, there existed a form of worship which necessitated no temple or building. The faith of the Parsee or the ancient fire worshipper. So far does this primeval idea go back in time, that history has failed to date its origin, or to say when it began. It may be that it is the very earliest form of religious faith on the face of the globe, the result of a natural and spontaneous feeling and perception in the human mind. The *sun* worshipper saw the sun, and could not but feel and perceive that to it he owed everything,—light and heat, and the very fruits of the earth. What more natural than to adore it? No temple or architecture was needed; nor, indeed, while the primitive idea held, was a building possible. It is not a little strange to contemplate such a necessity before Abraham was, and to find, as may be seen in Mr. Palgrave's book on Central Arabia, that this primitive form of worship yet lives as it ever did in the earliest ages of the world. In travelling across the Desert, his attendants, more than half savage and primitive in look and manner, hailed the rising sun on the instant of his new day appearance. No more could have been done by the primitive Arab. We cite this curious circumstance here as showing a phase of the "science of religion," as the Professor termed it, which called for no architecture, and required no building; thus differing essentially from those others where a building or temple of some kind or other was in all cases absolutely necessary. The primitive movable tent, or "tabernacle" of the wandering Israelite, and the fixed stone temple of Egypt, were absolute necessities, and could not be done without, and architecture could not but spring out of them in some form, greater or less.

But passing from this, which needs to be noted, and much more, we may come to Christianity itself, which, growing out of older thoughts, made a new "utterance" in the world. Much might, indeed, here be said,—and it is somewhat strange that so little has been said about it,—that this lecture in the nave of Westminster sounded not a little startling; and the architecture of the place, and its somewhat awkward new arrangements in front of the dim shadows in the distance, woke up strange echoes. The very vastness of the subject, and its wide significance, the "Semitic" races and the "Arian" races, and the "faiths" that have grown up, no man knowing how or when, seemed in the mere talk about them to well-nigh affright the old Abbey out of its propriety and watchful conservatism. But if in this very vastness and breadth of view we confine our attention at present to the widespread Christian faith, and to the material forms, and the architecture which it has fostered, if not given birth to, we shall find matter enough for thought and wonder. It is not one style of art that it has called into its service, but many. We do not here speak of the almost infinite diversity of Christian Church and Chapel architecture at the present hour, drawn as it is from all places and all times, but of that which was done in the old days, before "books" made all architecture alike familiar to the student and the practitioner. We all know how the Gothic, or Pointed, has been claimed exclusively as a Christian style of art, and how it has been said that it could not have grown up under any other religious system. Those who say this forget the great doings of the Mahometan architects of India, the Holy Land, Egypt, and even Spain. But, passing by all this, nothing most surely can be more wonderful than the way in which the "missionary" spirit, as Professor Max Müller terms it, of the faith of Christ, has adapted itself to all forms and modes of expression, artistic and otherwise. Gothic and Renaissance, both, have been its willing servants, and it would perhaps be hard to say in which style of art it has accomplished its most striking and impressive work. St. Peter's and St. Paul's, Cologne, and Westminster would seem equally in their several ways to attest its power. It is at home in them all; and we might dwell for a long time on these results of the building powers of the faith of Christendom, as it is to be seen in the length and breadth of Europe; but there are, or have been, two special phases of Christian building, or Christian expression, in material forms, that have always seemed to us specially interesting. First, when in its infancy, having no buildings of its own, Christianity dwelt in caves and "catacombs," and upper chambers; and then, gathering strength, in "basilicas,"—the times of its "prophets, champions, and martyrs." And then, secondly, when it commenced to build for itself, in the days of the great and solemn Romanesque. In no succeeding architecture did the Christian expression of religion assume a more impressive artistic aspect. It had then taken firm hold of the Western world, and all Europe went to work and built, every nationality in its own way,—all differing, yet all alike,—its great Romanesque churches and cathedrals, and religious houses;—from north to south, and from east to west. The Southern Romanesque, as that of Venice, was especially characteristic: nothing was spared to make it great. It would be a curious thing to realise, even in a picture or in fancy, the Christian Venice of the Romanesque days. There needs must have been a harmony amidst the several arts which all went to make up the art life of the city. We may yet see a something of this in the "ivories" to be found in antiquarian stores, and in them, though perhaps but faintly, we see how architecture, and sculpture, and costume, and the common things of daily life all went together to make up a consistent and harmonious whole.

Architecture and fine art will be found to throw no small light on the great subjects on which Professor Max Müller discoursed so learnedly, and so well, and so boldly.

NEW POLICE BUILDINGS IN KENNINGTON-ROAD.

During the last few months, new and convenient police-station buildings have been in course of erection on a plot of ground in Kennington-lane, immediately adjoining the extensive new premises called the Wellington Mills, recently built for Messrs. Oakey & Co., and which were described in the *Builder* some time ago. The land on which the buildings have been erected, including the parade-ground, is 126 ft. in length and 72 ft. in depth, covering an area of upwards of 1,000 square yards. The buildings consist of two distinct blocks, with a frontage to Kennington-road of 42 ft. in length each, with entrance, carriage, and foot gates in the centre, of similar dimensions. The buildings are 40 ft. in height from the street level, in addition to a basement. They consist of a ground-floor, and two floors above. The materials used in the elevation up to the first-floor windows are of Doulting stone, rusticated, and the upper portion of red Fareham brick, with stone dressings, the plinths, window-cills, and stringcourses which ornament the elevation being in Portland stone. The first-floor windows have bold arched stone headings, and the elevation is surmounted by a projecting stone cornice. On each side of the carriage-entrance gates in the centre there are stone piers surmounted by lamps.

One of the blocks, which is called the "station," contains, on the ground-floor, the charge-room, with cells in the rear. The first-floor of this block contains the inspector's apartments, including sitting-room, two bedrooms, and other domestic offices; the second-floor containing a similar set of apartments for the sergeant. The basement contains washhouse and stores, for the use of the inspector and sergeant. The other block, which is called the section-house, is for the use of private members of the force who are single men. The basement of this block contains a drying-room, messroom, cooking-kitchen, bath-room, and washing-room. On the ground-floor is the officers' day-room, library, locker-room, clothes-room, and brush-room. The first and second floors, which contain three rooms each, are furnished with twenty-five beds on each floor, there being thus sleeping accommodation for fifty men. The parade-ground at the rear of the buildings is 80 ft. in length by 34 ft. in depth.

The buildings have been designed by Mr. F. H. Caiger, the police architect and surveyor; Messrs. Merritt & Ashby, of London-wall, being the contractors; and Mr. J. H. Taverner, clerk of works.

The Temple at Jerusalem.—Mr. James Fergusson, F.R.S., read a paper, on Tuesday evening, the 2nd inst., at Sion College, London-wall, "On the Temple of Jerusalem." The chair was taken by Mr. Driffield, the president.

CHURCHYARD GATE, ST. JEAN-DU-DOIGT, BRITTANY.

CHURCHYARD GATE, ST. JEAN-DU-DOIGT, BRITTANY.

NOT the least interesting of the many picturesque and beautiful features of ecclesiastical architecture in Brittany are the churchyard gates, or, as they are called, "triumphal arches." These singular structures are, as a rule, late in date, and in some instances are excessively rich in ornament. The example we give from the churchyard of St. Jean-du-Doigt is one of the earliest we have seen, and dates from the end of the fifteenth century: it is not so rich or extensive as many others in the same neighbourhood, but its design is very pleasing and more appropriate than the more pretentious and wild buildings erected for the same purpose a century later. It is constructed entirely of granite, and is in a good state of preservation. When the name of "triumphal arches" first became applied to these structures in Brittany it is not easy to ascertain, but there is a kind of grim poetical notion about the idea mixed with a deep religious sentiment, which accords well with the general character of the Bretons.

The Church of St. Jean-du-Doigt is an interesting building of the fifteenth century, with a nave and aisles under one roof, a good tower crowned by a lead spire, a large porch, and many other objects of interest. The east window is a rich rose, with the star rather skilfully introduced into the tracery internally. The *double* font and one or two original altars are worthy of notice. The cemetery surrounding this church, in addition to the "triumphal" arch, contains a fine Renaissance fountain in cast lead, a simple Calvary churchyard chapel, and a small ossuary or bone-house erected against the base of the tower.

In the village are many interesting old Gothic houses, two of which are seen in our view.

BURLINGTON HOUSE, PICCADILLY.

THE Royal Society has taken possession of its new quarters in Burlington House (the eastern side of the quadrangle), the interesting collection of portraits have been hung, and its 30,000 volumes expeditiously transferred by Mr. Wm. White, the Assistant Secretary, to the handsome and commodious library prepared for them. This is on the one-pair, and has a lofty gallery around it, with columns in front up to the roof. The fittings of the apartments are of oak, as are those in the rest of the block of buildings, the ornamental work in plaster is sufficient for the purpose, and slight decorative colourings are here and there introduced. Hot-water apparatus by Mr. Haden is, when quite in order, to warm the various apartments, and will doubtless do so. The meeting-room, which is on the ground floor, separated from the entrance-hall by an anteroom, might have been made a little higher with advantage, but this was doubtless regulated by other requirements.

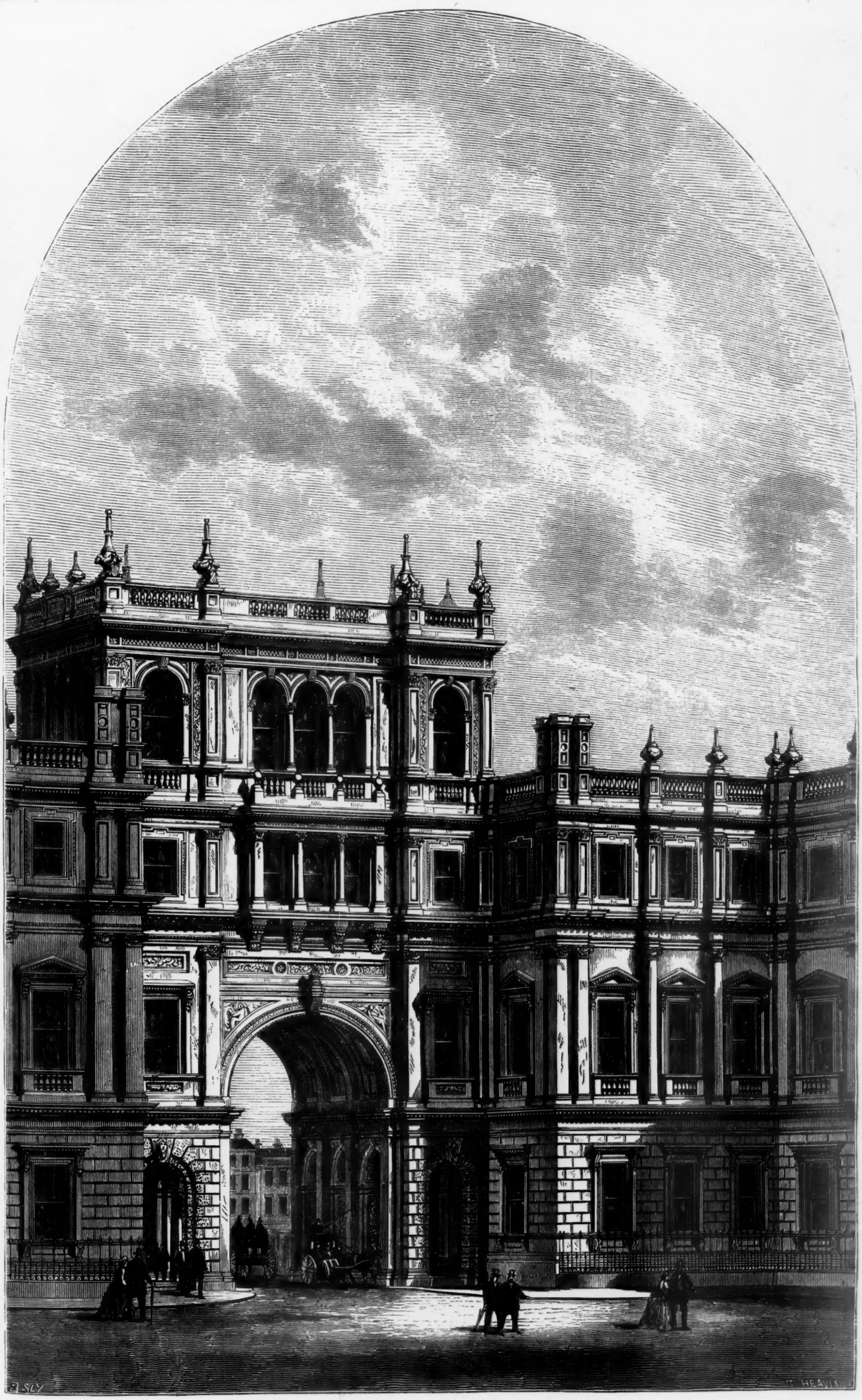
On a previous occasion we gave a view of the Piccadilly front of the new Burlington House, a plan showing the accommodation provided for all the societies housed in it, and some descriptive particulars of the whole.* To these we refer our readers, to avoid recapitulation. At that time (1871) the works, under the direction of Messrs. Banks & Barry, were in abeyance, in consequence of the failure of the original contractors. They were soon afterwards placed in the hands of Messrs. Perry & Co., of the Tredegar Works, Bow, by whom they are being carried out to completion, the lamented death of Mr. Banks, in the meanwhile, leaving the sole direction to Mr. Charles Barry, as architect. Mr. Daniel Ruddle, who had his training under Sir Charles Barry, at the Houses of Parliament, has acted as clerk of the works from the commencement.

Our present view shows the south-west angle of the building from within the quadrangle, and includes parts of the portions occupied respectively by the Linnean Society (next the great archway) and the Astronomical Society. The apartments next those of the latter, northwards, are for the Society of Antiquaries; these are fast approaching completion, and will doubtless be occupied by that distinguished body by April next. The iron gates to the archway in Piccadilly, now in course of erection, are the work of the Midland Iron Company.

* Vol. xxix., pp. 217, 226, 227.

THE CORPORATION WORKMEN'S DWELLING-HOUSES.

THE new workmen's dwellings in the neighbourhood of the Holborn Viaduct, the erection of which has for some time been under the consideration of the Corporation, have now been finally decided upon, and will shortly be commenced. At the meeting of the Holborn Board of Works, held last week, Mr. Isaacs, the surveyor to the Board, stated that he nad seen the plans of the intended new buildings about to be erected by the Corporation for the artizan classes, on the site of Union-court, one entrance being from Bleeding Hart-yard, and another in Field-lane, at the foot of the steps recently erected by the Corporation as an approach from Field-lane to Charterhouse-street. The plans embrace four blocks, each to contain accommodation for ten families, thus making forty in all. Mr. Isaacs observed that the quantities were being taken off to enable the Corporation to receive tenders. The Board expressed their satisfaction at the prospect of the long-promised buildings being at length erected.



BURLINGTON HOUSE, PICCADILLY: VIEW WITHIN THE QUADRANGLE.—MR. CHARLES BARRY, ARCHITECT.

ART FOR THE MILLION.

SHAMS.

SIR,—Mr. C. H. Whitaker, in his last communication (p. 949), has illustrated at more length, and thus made additionally clear, his views on the production of shams. I feel personally obliged to him,—as, no doubt, do others of your regular readers. I may say also that there ought perhaps to have been no misunderstanding about the drift of his former letters (pp. 770 and 890): this is quite evident when they are re-read,—after his last. It does away, to a great extent, with one of the radical failings of written opinion, when it can be supplemented as the exigencies of readers seem to require. "I cannot help feeling, Phædrus, that writing is unfortunately like painting; for the creations of the painter have the attitude of life, and yet if you ask them a question, they preserve a solemn silence." But, then, the Platonic Socrates—speaking over 2,000 years ago,—and providing thus what might be used as an implied apology, in some cases, for us poor moderns,—had not our advantages in the way of weekly and well-disposed journals. . . . . The Vienna awards—in so far as they may indicate inferior taste and skill in our manufacturers,—ought decidedly to be brought into the fullest possible prominence, with a view to future improvement. The fact (if it is a fact) that much of this failure has resulted from the errors of purists in the decorative arts,—their defective theory, and consequently erroneous teaching,—would deserve to be enunciated and reiterated till it was universally acknowledged, and a new course entered upon. After just an intimation that few of us feel so sublimely virtuous as to reject good thinking, even if it should happen to be prefaced by a simple *àpropos de bottes*, and after these other explanations, I will consider myself at liberty to take up the questioning where it was left.

The matter seems, then, to divide itself now into (1), culture (by means of the arts) of uneducated persons and children, and the best method of effecting it; and (2), the use of imitations by the rest of the world.

1. Here we have a very wide and long-debated question. It would seem quite possible to regard the many sides that present themselves for notice in any consideration of the aims and methods of education as far from a drawback. Perhaps each may do good service in its turn. So long as the practical work of teaching is steadily pursued,—according to the best system yet got into working order,—we need not complain. It is the proper work of theorists to force into notice any special defect or excess,—and thus to render systems more symmetrical to compel the nicer adaptation of means to the attainment of ends; and bring about larger modifications still when it has been agreed that there has been some mistake as to the ends themselves. Are we to conclude that there has been a misapprehension of the things to be aimed at?—or only of the means? In this case of the little luxuries, the possible decorations of the cottages of the poor. If the former, we seem to let ourselves in for still expanding issues. If the latter, the question is still very wide,—quite wide enough for me to touch on it only just now. . . . . May something which has been put forward as to pure savages be considered to have a bearing on—culture by means of things thoroughly within the reach of the taught?

I have formed no opinion, I should say, on the correctness, or humanity, or any other quality of the theory, but simply state it as it has reached me. Observers have, it seems, noted painful failures in the work of quickly-civilising savage races. By means of exertions, that could not be too highly lauded, made by devoted men, savage races have been persuaded to live in communities, to affect the manners of the nations of Europe, to aim after the realisation of the highest personal and social virtues of civilised man. Great success would seem to have attended these efforts, made with energy and steadily persevered in. Schools and churches have been built; religious services attended as a custom; habits of patient labour sometimes acquired,—all the most obvious details of life at the old home of the teachers copied with an earnestness, a thoroughness, that is not without its pathetic interest. The best models known to these teachers have been followed, and the unbounded submission of the weaker-willed and less self-mastering people under their sway has been secured. But the imperfectly-conquered savageness will, it is said, on occasion,—and the occasions are much too frequent,—show itself quite untamed. The old wild love of unrestraint breaks the linen bands that have held it in; and the moral that is pointed to as a consequence is, that no power, except the continual action of formed habits persisted in for generations, can forge the iron fetters which are worn without pain, and still effectually restrain from excesses of any kind,—the majority of a well-trained people. It is of course added that this slowly-acquired self-command is the security for the permanence of the achievements of the past,—menaced in the worst of cases only by a small section made temporarily delirious by special causes, and not restrained and cured, as they should be, by the exercise of genuine wisdom and merciful strength. In view, then, of this tendency to relapse, in the case of savages, it has been argued that the teaching which has most permanent influence on them,—which moulds their natures and forms their habits,—is that derived from the actual example of those who are nearest in culture to themselves;—such as the sweepings of our cities,—the driftwood, so to speak, of civilised humanity,—and the somewhat better class of imperfectly-educated Europeans who man the ships that trade between old countries and those now first beginning to have a history. From such persons the natives are said to imbibe in an effective and permanent way the germs that hereafter develop into the sentiment which makes the binding obligation of duty the commencement of habits that go towards some self-respect and self-restraint, &c. I probably need not pursue this further. The argument seems, as far as I can judge, not far from analogous to Mr. Whitaker's, that decorative art should speak the language most readily intelligible to those possessing the least general culture. That there are numbers of people in our own country, whose mental, moral, and social condition is not removed so far from that of savages as might have been hoped from the length of time during which the work of civilisation has been going on, and the high culture elsewhere evident;—that in fact we must begin thoroughly at the beginning, and treat hosts of grown-up men and women of our own country,—as a matter of policy,—to the sort of teaching which, in the case of children, has excited times and again indignant protest (viz., teaching that must be wholly unlearnt when,—if ever,—the intelligence is sufficiently developed). I should look for answers to the kind of difficulties here hinted at in the further communication Mr. Whitaker has promised. He will (to mention one or two details as well), I hope, show the region for which "the sterile, barren, and unattractive one occupied by the disciples of the doctrine of the purists in decorative arts" ought to be abandoned. Also whether he intends absolutely, or only as an exception, to recommend a recurrence to,—what we have for the most part agreed to consider,—errors in decoration; such, for instance, as fully-shadowed subjects for the flat surfaces of floors, walls, &c. The use of more or less colour touches no question of principle. The present interest in Chinese and Japanese art owes its strength very largely to a reaction that has been gaining force for some time,—tending towards the more general application of varied and delicate colour and unexpected harmonies.

The conclusions that may be come to as to these matters should affect so materially what one might have to say on what I have called the second division of this subject, viz., the use of imitations by others than the very poor and ignorant. Therefore, and because I am afraid this would in itself be likely to occupy more space than you would be willing to accord me in continuation of the foregoing, I had better hold back the further perplexities of

A SPECTATOR.

BONDING COURSES.

SIR,—Want of information with reference to the results of experiments ought perhaps to deter me from addressing you on this subject,—or perhaps it may be accepted as a sufficient motive for my doing so. Some of your readers are, I doubt not, aware of facts that they have come across, in the course of practice that would solve other people's difficulties as well as mine. I must confess to a fairly diligent look-out for such facts,—in actual work, and among foremen, clerks of works, and others connected with building;—but I have found very little in the way of exact observation on some of the points, and absolutely nothing in the way of special experiment. From this it results that I am only able to put the case as I have learnt it,—the advantages of bonding courses being supposed to be:—

1. That they *spread weight*,—doing service in their way similar to that performed by wall-plates, templates, landings in foundations and piers, &c. This is done by a comparatively thin beam of stone when that material is used. In a specially unfortunate and unusual case, the greater portion of the bed under such a stone might happen to be hollow, and then—with a thickness of say 6 in. and a length of 4 ft.,—it would bridge a distance short only by a very few inches of its own length. Fracture might reasonably be expected with any considerable weight above; but in practice this would probably happen not once in a hundred instances. The whole bearing of the stone being covered with soft cement or mortar, this yielding material will be forced by the stone's weight,—certainly with the addition of a very little superincumbent matter,—into all the irregularities of surface. On the occurrence within the area of the flag of an unequal subsidence, the stone acts as a beam, with a bearing measurable in inches, and finds—it may be before long—a uniform bed once again. The temporary conditions have been changed in the imperfectly solidified work, which is, in fact, not only hardening within itself, but also setting up, as best it can, permanently satisfactory relations between its several parts. If through failure of foundations it should come about that the line of separation, between two sections of any wall, cut through such a bonding-landing, it would also fracture it,—break it in two probably like a biscuit,—when the separation had become so considerable that the beds of the work could not tilt themselves any longer. But this is a case in which ruin would be inevitable,—no matter what precautions were taken to make the superstructure act together. If this view of the case is correct, bonding-courses of brick in cement may not have been treated by "B." in the *Builder* (p. 930) to all the consideration they deserve. Such a bonding-course,—composed, say of two courses, the brickwork in thickness, all thoroughly bound into one mass by quick-setting cement,—might fairly be compared with a "flat ring of stone, 12 ft. or 14 ft. in external diameter, and only 6 in. thick,"—if only this point of difference was first noted,—that the brick and cement ring has the great advantage, as far as its resistance to fracture is concerned, of being, within some slight limits, able to re-adjust its form. However quick the cement may be in setting, the ring cannot be "a rock" for days or even weeks. If the stone ring is not supposed to be continuous—(in one piece for its whole size)—the liability "to break like glass wherever the least inequality of pressure took place" would appear less certain; and this suggests to one what is likely to be the case with the brick and cement. It is sufficiently pliant to act as a succession of short stones would,—*i.e.*, each part of the length takes up its own position without being affected by what the others are doing. The inequalities are very minute: this is supposed from the very first. But while the bonding-course is showing this want of complete rigidity, it is well enough compacted to act together over sufficient areas; and thus serve the purpose for which it was introduced, and effectually prevent severance of walls or piers as the result of the slight differences that probably exist in every square foot of brickwork actually executed,—such differences being caused by difference of size of bricks, and the fact that some are well wetted and others but little, helped, of course, by fitted or unfitted cross-joints, uneven layers of cementing material, &c.

Bonding-courses,—in which hoop-iron is also used,—may be regarded as still more effective. Not only is there added the weight-bearing strength of the laths themselves, but the iron strips supply, as only iron can, the tensile strength of which the material stood in need,—making a powerful Brunel beam of the whole construction when used thick enough. The resistance to compression may in most cases be supposed to be ample; but the brick in cement and concrete lintels which bridge such considerable spaces at times cannot do without the insertion of the irons, which supplement their powers where weakest, and thus increase their forces many times.

2. As to this, much less need be said. Still it is not necessary to pass over the fact that with the hoop-iron they act also as *girdles*. In

structures covering small areas, and tall in proportion to their height, such as towers, chimneys, &c., it is absolutely necessary for safety to compel the whole to stand together, and maintain its original form unaltered. When the area of the building is considerable, and the continuity of the bonding-courses is broken by openings, and there are few cross walls to brace the hoop-irons back, it would seem likely that their action will be simply local. They will pull together certain sections of wall; also prevent,—to the extent of their own resistance to lateral flexure,—any tendency to bulge. The intimate contact set up with every portion of the material round it by the iron is equal to a pinning-down at numbers of points. Hoop-iron, tarred and sanded with coarse sand, must be perfectly incapable of sliding on the brickwork under it, when only a few courses have been built above. In ordinary buildings they may even do more than in larger ones.

3. This is especially seen to be so when we consider the main use of almost all artificial bond to be *temporary*. It supplies something to counteract against the heavy demands made in the usual course on work, when it is least able to stand them. There are all the temporary inequalities before alluded to; and in addition,—almost always,—scaffolds, with workmen, hoisting apparatus, heaps of materials, &c., derive all their steadiness, and some of them support, from what a very little while ago formed part of similar heaps.

Of the many queries as to details that might be put, beyond those suggested above, I will limit myself to :—

A. Is it not desirable to build iron into all brickwork—in cement only? not in mortar? I have heard it commonly asserted that lime mortar perishes by the action of iron. Is, however, the tarring a sufficient preparation for its insertion of the iron, without risk, in a mortar bed?

B. Will any such result happen from the use of a mixture of lime mortar and cement? Bricklayers have told me that the mixture made of cement and sand is so "short," that the addition of mortar makes a compound more readily used, and more evenly distributed by most workmen. It is, if I remember rightly, sometimes used, one third of mortar to the requisite bulk of cement and sand, mixed in the proportion found to suit the cement; and as put by workmen, the result is simply a substitution of one cementing material for another throughout the bulk of the compound,—not a further weakening of the cement. I have had a suspicion that the ingenuity of foremen leads them to attribute defects to others and to materials a little wildly at times; and that by some strange coincidence their masters, and therefore their own interests, are almost always served by the remedies they devise. But there is perhaps something in it.

C. What is the use of carrying the hoop-iron bond through openings? Instances must occur when the bonding-courses can only be put where they will be interrupted. It is difficult to imagine when they are seen in wide openings, sagging so much with their own weight, that they can act as effective girdles within the narrow limits of possible lateral movements in buildings tha' are going to stand any fair chance of stability. Should the bond be tightened artificially? Or is it worth while to let the iron be wasted and to involve the trouble of cutting later on,—in order that it may be clear on inspection that forgetfulness has not resulted in a saving of expense to the contractor? X.

SCHOOL-BOARD SCHOOLS FOR LIVERPOOL.

THE foundation-stone of new schools to be erected in Butler-street was laid by Mr. Bushell, the chairman of the late local School Board, in presence of Mr. Foster, M.P., Vice-President of the Council on Education, who was mainly responsible for the passing of the Elementary Education Act. Afterwards Mr. Foster went to Queen's-road, where new schools, built by the School Board, are approaching completion. Here he placed in the front of the building a stone to commemorate the erection of the schools. In an address Mr. Foster reviewed the history of the Education Act, criticised its opponents, and defended the Act in a speech of an hour and a half's length.

The schools of which the memorial stone was raised are erected on a piece of irregularly shaped land, having a long frontage on the west side of Queen's-road, and are the first of the series now being erected by the Board, both as regards the date of their commencement and superiority of position. The general outline of the building is that of an inverted T, presenting a façade of 185 ft. in length to Queen's-road, and running backwards to a total depth of 103 ft. On the ground floor are placed two infants' schools, one 55 ft. by 22 ft., the other 39 ft. by 22 ft.,—each provided with junior and senior infants' class-rooms; and the senior boys' school, 39 ft. by 22 ft., with two class-rooms, each 18 ft. by 14 ft. On the upper floor are schoolrooms for junior boys and girls, each 55 ft. by 22 ft., with double class-rooms, 18 ft. by 14 ft.; also a senior girls' school, 39 ft. by 22 ft., and two class-rooms attached, each 18 ft. by 13 ft. 6 in. The various class-rooms are planned to permit of two being thrown into one by means of Stone's sliding London School Board sound-proof partitions, and the larger schools have similar provision for subdivision when required. Each room is provided with through light and ventilation, and will be warmed by hot-water pipes in addition to the open fireplaces. The ground floor is 14 ft. high, and the upper one is 16 ft. A drawing-room, mistresses' room, board and head master's room, and caretaker's rooms are provided. A large portion of the girls' and infants' playground will be roofed over, and access to the various departments and to the latrines is obtained under cover. The total accommodation provided is for 1,000 children, viz., 400 infants, 300 boys, and 300 girls. Each school department is supplied with separate entrances, hat and cloak-rooms, lavatories, &c. The whole have been carried out from the designs and under the supervision of Messrs. T. Cooke and John E. Reeve, of Liverpool, architects, whose plans were selected in competition, and have received the sanction of Mr. E. R. Robson, architect to the London School Board (and consulting architect to the Liverpool School Board). Mr. J. Henshaw, of Liverpool, is the sole contractor, and the masonry has been executed by Mr. W. Thornton, joiners' work by Mr. Samuel Webster, ironwork by Messrs. Tessimond & Kissack, slating and plastering by Mr. T. Jones, plumbing, &c., by Mr. W. Merrick, all of Liverpool. Mr. William Laidlaw has been clerk of the works. The amount of contract is 7,430*l*. The front to Queen's-road is built of Yorkshire par-points, with red Runcorn stone dressings, and the style selected by the architects is domestic Gothic.

At the laying of the foundation-stone of the Butler-street schools, fronting Penton-street, Mr. Bushell addressed the assemblage. After a few preliminary remarks, he said the school which was now about to be commenced was one of six schools which formed the first part of the Board's work. These six schools would provide for 6,200 children at a cost, including their sites, and all needful fittings, of something like 68,000*l*. In addition to these six schools the Board proposed, and the Education Department had sanctioned, a further provision for something like 5,000 children, making provision for some 11,000 altogether, at an entire cost of 123,000*l*. That money had in part been borrowed, and the remainder might be borrowed from the Public Works Commissioners at an interest of 3½ per cent., which, with an additional ¾ per cent. for a redemption fund for fifty years, would involve a sum upon the rateable value of the borough of something more than ½d. and less than ¾d. in the pound.

THE VACANT BUILDING-LAND IN CANNON-ROW.

THE Metropolitan Board of Works have decided to let the vacant land at Cannon-row, adjoining the Thames Embankment, near the new St. Stephen's Club, for building purposes. At the meeting of the Board last week the Works Committee reported that they had had under consideration the utilisation of the land in question, and that the Board having finally decided not to form an approach to the Thames Embankment by a continuation of Derby-street, the committee had instructed the architect to prepare a plan of the ground, and advise as to the course to be taken. It appeared from this plan that the land belonging to the Board, following the old line of frontage, has a frontage to the Victoria Embankment of 210 ft. by a depth of 189 ft., with a frontage to a portion of it in Cannon-row of 102 ft. The committee thought that the time had arrived for letting the land for building purposes, and they recommended that advertisements be at once issued inviting tenders. The recommendation of the committee for building on the land was agreed to.

MANNINGHAM MILLS, BRADFORD, YORKSHIRE.

THE erection of premises in place of those destroyed by fire, about two years and a half ago, together with additions and extensions that will entitle Messrs. Lister & Co.'s works to be regarded as equal to any in the country, are drawing towards completion. The great chimney has been recently finished. The new works are of more than usual interest, as velvet-weaving by power-loom machinery is introduced, a process which, it is anticipated, will work a decided revolution in the velvet trade. The use of power-loom machinery in velvet-weaving has hitherto been vainly sought after; but Mr. Lister, after spending many thousands of pounds in experiments, has, after many years' study, been fortunate enough to solve the problem. The extension of the works is effected by the erection of shed continuations of the premises built some time ago, and also by the building of a large mill and warehouse. The centre of the buildings, fronting to Heaton-road, is occupied as offices; and this centre block rises slightly above the shed-walls on either side, and is a little more ornamented than the rest, with high-pitched roofs at the ends.

The works have a frontage to Heaton-road of 350 yards, and they extend westward 150 yards, where they are bounded by Patent-street. They thus cover an area of about 52,500 square square yards, being nearly eleven acres, and, reckoning the several stories of the mill and warehouse, give a total extent of floorage of abont sixteen acres. The new mill, to the west, at the rear of the combing-shed, is six stories high, not including the cellar, of good external appearance—in dressed stone, having a bold cornice, with blocks, and above this an ornamental and panelled parapet. The staircase is in the centre of the front, and stands clear out from the main walls. It is more ornamented than the rest of the building, and, with its turret-formed roof, surmounted with a large flagstaff, makes a feature in the great length of frontage. The four corners of the mill are also marked by raised parapets. Each room contains an area of 2,000 square yards, the tier of windows on each side numbering forty-one, so that, at a rough calculation, the whole mill will give an area of about 12,000 yards. The new warehouse, further to the rear, parallel with the mill, but separated from it by the reservoir, is six storeys high, and will furnish, reckoning each floor, room to the extent of about 14,000 square yards. The top rooms of both warehouse and mill have shed-roofs, and may be used for loom-weaving.

Each room in the mill, warehouse, and sheds is lofty and well ventilated, and provided with water-closets, lavatories, drinking-taps, and other arrangements conducive to the comfort of the workpeople. All the buildings are fireproof, even to the window-frames, which are made of iron. Each floor is of Dennett's concrete arching, resting on iron beams, supported by pillars of the same material. The supporting-pillars are fluted and ornamented. The inner walls, instead of being covered with a uniform whitewash, are painted; and the staircases, to the height of 5 ft. or so, are lined with polished brick.

There is an immense chimney at the rear of the central shed, and at the end of the new warehouse. It is 83 yards high, square in form, and outwardly of a uniform width from bottom to top. Nearly 7,000 tons weight of material have been used in its construction. The inside width is 10 ft., gradually increasing towards the top to 11 ft. The object of this arrangement is to provide a better vent for the smoke as it ascends and expands, being the reverse of the old practice of building shafts, which "throttled" the smoke at the place where most space was required. The chimney is of an ornamental design, having panelled sides with circular heads. At the height of 200 ft. is a bold cornice, surmounted by a circular panelled and ornamented parapet 50 ft. in height; this is again covered with a cornice. It is intended that this chimney shall serve for the whole of the works.

A large village has been built on the south-west side of the works. It is intersected by six new broad streets. Beamsley road bounds it on

the north and Lilycroft-lane on the south. One of the new Board schools is erected in the latter There will be room in it for 600 boys and girls.

A co-operative store on the most approved model has been built in connexion with the village, and is occupied as a branch of the Bradford Industrial Society.

Messrs. Lister & Co. manufacture silk yarn, sliver, sewing silk, silk cords, Japanese silks, silk ribbons, velvet ribbons, silk and cotton velvet, plush, &c. They also dye their own yarn and velvets.

The land opposite the front of the works in Heaton road has been laid out as building sites. Rows of villas and cottages are fast rising there; and in a short time there will be but little, if any, green fields separating Heaton from Manningham.

The architects for the works are Messrs. Andrews & Pepper, Bradford; and Mr. A. Rhodes, is clerk of works. The contracts and plans were carried out under the supervision of Captain Lepper, agent to Lister & Co.

THE ARCHITECTURE OF CHINA.

"THE TEMPLE OF HEAVEN." *

I CONSIDER that it was fortunate for me that I chanced to visit Nanking while in China; for there I saw another Ming tomb. When this dynasty began, Nanking was the capital, and Hung-wu was the first Emperor of the line. His tomb is still an object of attraction amongst the ruins of that vast city. The residence of the court having been removed, the tomb at Nanking has not been so well looked after as those at Peking; and it must have suffered during the Taeping war. I found the trenches by which Nanking was taken by the Imperialist troops all about the tomb. It seemed to me as if the buildings had been burned, for the stone bases had all the appearance of having been chipped and cracked by the action of fire. Although in ruins, the plan of the tomb could be easily made out. With some slight differences of detail, the arrangement is the same as that of the tomb of Yung-lo. I should say that if anything, the sepulchral mound is larger. This tomb is also at the very base of a ridge of hills, which cover it from the north wind, indicating again the influence of the *Fung-Shuie*. This tomb has also an approach, bordered with sculptured stone figures, like those near Peking. I had a Chinaman with me at this visit as guide, but unfortunately he could not speak a word of English; however, when he saw me sketching, he used the word "*loong*," and pointed to the road with its men and animals. This word, I knew, means *dragon*, and as it is supposed to be only one of the various forms of the serpent, I became anxious to know what my guide meant, and I questioned him repeatedly to see if I was right in understanding that he applied this word to the long approach; I even sketched a serpentine dragon to test him, and he signified his approval of it. From this man's manner I am certain that the twisted form of the way receives from the Chinese the name of the Dragon; but whether they have the idea in this case, which has been suggested as the theory upon which the stones of Carnac in Brittany, and the avenues at Abury, are supposed to be laid down, I could not say. I made inquiries on this subject while in China, but could find no one who had studied Chinese architecture from this point of view. My stay in the country was short, or I would have had this matter cleared; and I mention it here so that those who take an interest in dracontine temples and serpent worship, may take the subject up and make further inquiries. I should be rather inclined to believe that the *loong*, or dragon, has something to do with it.

I was able one morning while in Peking to visit the Temple of Heaven; and, so far as I know, this curious shrine has not yet been fully described in our language. I have seen Du Halde's account, but not the faintest notion of the place could be formed from it; and his plan of it is fanciful and inaccurate. Photographers who hove penetrated to the place have always given the north altar as the Temple of Heaven, whereas it is only a portion of it, and not the most important. The few travellers who have described the place have been attracted by the building on the north altar, and have not even mentioned the south one, which I now believe to be the most important part of the whole. The Chinese themselves have written descriptions of the building which were made out at its construction, and which explain the purpcse and meaning of it all. The Rev. Mr. Edkins, who is a Chinese scholar, has drawn from this source, and written a chapter upon the subject, which will be found in the appendix of a book of travels by Mr. Williamson, a missionary. I mention this as the source of much valuable information, but I could wish that everything connected with this very important temple were translated from the Chinese authorities, and accessible to us Westerns.

There are in Peking a number of Imperial temples, such as this Temple of Heaven; the Temple of the Earth; the Temple of Agriculture; the Altars of the Sun and Moon; and others. The ceremonies at all these temples have no relation with any of the three religions followed by the people of China; these being the Tauist, the Confucian, and the Buddhist. The Emperor only is the worshipper in these Imperial Temples at Peking. He is not only the Worshipper, he is at the same time the Priest. It is another example of that old idea of priest and king—of the spiritual and temporal power combined in the head of the State. As the present Emperor has been a minor for the last ten years, the services at these imperial temples have not been performed, or they have only been done by deputy. On the 21st of December last—that being the winter solstice according to Chinese reckoning—the young Emperor officiated for the first time at the Temple of Heaven. At the vernal equinox the Emperor repairs to the Temple of Agriculture, and ploughs a portion of land, upon which he sows five varieties of grain. This is done as a model of industry to his people. The ceremonies at the Temple of Earth take place at the summer solstice, when a bullock is sacrificed and buried.

The Temple of Heaven occupies about a square mile of ground: that is, the outer wall is about four miles round, inclosing a large space, which has a park-like appearance, with avenues of trees. Here the animals kept for the sacrifice find grazing. I was struck by noticing that this temple has three inclosures: whether this is accident or not I could not say. I know that the three-fold division is common to temples all over the East. We have the Tabernacle of Moses and the Temple of Solomon; and the Eastern churches to this day follow this three-fold division. The Umbrella is an old symbol of dominion and power, and the Chatta of Buddha is triple, implying, no doubt, sovereignty over "the three worlds," which are so often referred to in the ancient classics of India. They are as old as the Ramayana. One of the most important of the insignia of the Emperor of China is a triple umbrella; and it will be seen that the circular building on the north altar of the Temple of Heaven has a triple roof. The north and south altars have a triple terrace. From this we may almost presume that the three-fold inclosure of this great temple is not accidental. The plan of Peking itself has this same arrangement: there is the Tartar city; within that is the Imperial city; and within that again, like a *sanctum sanctorum*, is the palace of the "Son of Heaven." That the Chinese do these things in virtue of symbolic ideas, I will give a quotation from Gutzlaff. He says that China "is a heaven upon earth—*the Celestial Empire*. They have endeavoured to model their government after Nature, and the laws of the visible heavens. Even their military standards and royal palaces are supposed to have resemblance to celestial objects." It would have been valuable if we had had this author's explanation as to how his countrymen carried out this symbolism. We are left in the dark, but we will see as we proceed that the Temple of Heaven has a signification in almost every stone of which it is composed. The central portion of the Temple of Heaven contains two altars, which are distinguished as the north and south. I will first describe the south altar, as I believe it is the most important part of the temple, and also because I think it will convey more clearly the original idea upon which the whole was constructed. At the first glance it would strike the observer that it was merely a platform for a band to play upon. There are three circular terraces built on each other, each about 6 ft. high, which are ascended by four flights of steps, one towards each of the cardinal points. On the top of this there is no house, only the five vessels, in marble, which are to be found on all Chinese altars: a canopy is erected upon occasions of celebration. Although we apply the term "temple" to this, the Chinese, as will be seen, only call it an altar. Still we might apply the old Greek term, and give it the name of a hypæthral temple, for it is truly that, having no roof but the dome of heaven above. The visible objects, to which worship is directed at this shrine, is the tablet of Shang-ti, the God of Heaven, and to the tablets of the deceased Emperors of the present dynasty. Few temples in the world are so free from idolatrous forms as this. The Emperor prays, and offers incense, as an oblation of fire. He drinks, and eats the "Flesh of Happiness,"—almost repeating the sacramental ceremony of the Christian Church. Mr. Edkins says, "to Heaven alone is offered a piece of blue jade, cylindrical in shape and a foot long, formerly used as a symbol of authority." There is a furnace of green porcelain below, and eight smaller furnaces of iron; and while the ceremony is going on above, a bullock—it must be two years old and without blemish—is being burned with sheep, pigs, rabbits, and deer; pieces of silk are also burnt as offerings. Dancing and music are also part of the performances. The Emperor comes to the temple the night before, and fasts. The hall where he is lodged is called the *Chai-Kung*, or the "Hall of Penitential Fasting," and the ceremony takes place at the dawn of next day. This is only a very rough outline of the ceremony; and I will now give some details of the symbolism of the construction of this altar or temple.

The four ascents, with approaches and gates to the four cardinal points, have no doubt an astro-geographical signification. The Imperial temples of Peking have been constructed with reference to the relations of numbers, and this is more particularly the case in the Temple of Heaven: the upper circular top is 90 ft. in diameter; the middle terrace is 150 ft., and the lower 210. These are multiples of $3 \times 3 = 9$, $3 \times 5 = 15$, and $3 \times 7 = 21$. The number nine figures largely in it. The ascent to each terrace has nine steps, the whole ascent being $3 \times 9 = 27$; the pavement on the top is formed of nine circles of marble slabs; the first circle has nine slabs, the second is formed of 18, the third of 27, and so on, each circle being a multiple of 9, till at the outer circle $9 \times 9 = 81$ is reached,—a favourite number in Chinese philosophy. There is a central stone, and there, — surrounded by these symbolical circles, with terraces and enclosing walls, and the circle of the horizon as the extreme of the visible world,—a deified Emperor seems to himself, and to his court around, to be the veritable centre of the universe. With his face to the north, and assuming the attitude of a subject, he acknowledges in prayer, and by his position, that he is inferior to Heaven, and to Heaven alone. One of the statements I heard while in Peking was regarding the number of second, third, and fourth class wives which would form the complete hareem of the Emperor, and, strange to say, they were multiples of 9, being 9, 27, and 81. It is rather startling to our Western ideas that a hareem and a temple should be arranged on the same symbolism. "The balustrades have $9 \times 8 = 72$ pillars, and rails on the upper terrace; on the middle terrace there are 108, and on the lower 180: these amount in all to 360,—the number of degrees in a circle. The pavement of the middle terrace has in its innermost circle 90 stones, and in its outermost 162 stones, thus reaching the double of 81, the outermost circle of the upper terrace. So, again, in the lower terrace, the circles increase from 151 stones, the innermost, to 243, or three times the square of 9, for the outermost." These numbers are given on the authority of Mr. Edkins, and I will still further quote from him in relation to this temple. He says:—"It has been an aim to use odd numbers only: heaven is odd, earth is even; heaven is round, earth is square; or, to use the ultimate expression of Chinese metaphysical thought, Heaven is Yang, Earth is Yin. The numbers 1, 3, 5, 7, 9, belong to Yang, Heaven; the numbers 2, 4, 6, 8, 10, belong to Yin, Earth. In the official published accounts of the Temple of Heaven, this is set down as the fundamental

* From a paper by Mr. William Simpson. See p. 958, *ante*. In previous portion, "fine-clawed dragon," should be *five-clawed dragon*, that being the distinctive character of the Imperial insignia. "Manikiola Tope," should be *Manikiala*, well known to students of Buddhist architecture in India; also known as the "Tomb of Bucephalus." It is in the Punjaub, not very distant from where Alexander fought with Porus: hence the reason of this tradition getting attached to a veritable Buddhist Dagopa. The only other matter worth noticing is the length of the enclosure at Yung-lo's tomb. I wrote "1,000 ft.," but on referring to my notes afterwards I find it ought to be 1,200 ft. It was a rough measurement, made by stepping, and it is quite possible that the 1,000 ft. may be as near as our conclusion that it was 1,200 feet.
WILLIAM SIMPSON.

principle." I quote still further from the same authority respecting the Temple of Earth, as it by comparison assists us in understanding the subject:—"On the north side is a double terrace, the upper 60 ft. square, and the lower 106 ft. square, and both 6 ft. in height. The paving-bricks are in multiples of 6 and 8; 36 and 64 are the favourite numbers, for we have now come into contact with Yin, the principle of darkness, which affects a square form and even numbers, just as in the Temple of Heaven the Yang principle was represented by roundness of form and odd numbers. The principal sacrifice is offered at this altar on the day of the summer solstice. There is, near the altar, a pit for burying a bullock. At the altar of heaven, when the bullock is burnt, the Yang principle in the sacrifice is supposed to go upward in smoke and flame. At that of earth, on the contrary, when the victim is buried, the Yin principle descends in connexion with death and corruption." I may here explain that the *Yin-Yang* are the Chinese symbolic forms of the dual powers of nature which underlie nearly all primitive worship. And it is important to find it here as the declared fundamental principle on which these temples are constructed. There is a circular dwarf wall round the altar, with three doors at each of the cardinal points, and leading to the steps of ascent. Another low wall is beyond this again, with the same number of doors corresponding to the others. It is between these two walls that the altars for burning the sacrifices are placed, in the south-east corner. At the south-west corner are three very long poles, which I was told were for lanterns, as the ceremony begins early in the morning, before it is full day. On the north of the altar is a circular building, where the tablets are preserved. From this a great built-up way leads to the north altar. On each side of this way, and all round both altars, is a thick grove of cypress trees.

The north altar is a triple terrace, nor differs much from the south altar. The one most striking feature is, that a large circular house is erected upon the top of it. It is this which gives it such apparent importance, and has caused it to be taken by travellers as the real Temple of Heaven. Undoubtedly it is a part of the temple; but as the great ceremony of the winter solstice is performed at the other, I give it the precedence. It is called *Chi-Kien-Tien*, or "Temple of Prayer for the Year." It generally goes by the name of *Tien-Kung*, or "Heaven's Palace." The Emperor prays here once a year, offering sacrifices similar to those at the south altar. On occasions of famine, or national calamity, it is at this altar that he prays to heaven.

The south altar has four ascents, with gates and ways leading off to the cardinal points, as if it were approached from the four quarters of the globe. The north altar, on the contrary, has only one approach—from the south; but it has eight flights of steps. This is founded on the *Pah-Kwah*, or the "eight diagrams," a symbol equally profound with that of the *Yin-Yang*, and which figures largely in the ancient Chinese classical books as the basis of their religious as well as their philosophical system.

This circular temple, or palace, is a very beautiful specimen of the wooden architecture of China. It is 99 ft. high; four round pillars support the central and highest roof, which is nearly all gilt on the inside; twelve smaller columns sustain the second roof, which reaches only from the four inside pillars, thus leaving visible from within the whole height of the highest roof. Twelve still smaller wooden columns form the outer circle and support the lowest roof, which, like the second, only roofs the space between the pillars, which sustain it and the circle of pillars next to them. All this woodwork is elaborately painted and gilt. The tiles on the roofs are now all of a deep ultramarine blue; at first only the upper roof was of this colour, the middle was yellow, and the lower green; but the Emperor Kien-loong, who ascended the throne in 1736, changed them all to one tint. In the inside, the altar to Shangti, or the Supreme Lord of Heaven, is on the north; and the altars to the deceased emperors of the present dynasty are on the east and west. On the occasion of my visit it was all very dirty, and the pavements of the outside were covered with grass and weeds. This was owing to the fact that the place had been unused on account of the Emperor being a minor for so many years; but workmen were busy putting it all in order for the ceremony to take place at the last winter solstice.

In my travels, temples have always been a study to me; and I feel a certain degree of satisfaction in having seen, and in being able to describe this unique place of worship at Peking. It is so new to us, and so exceptional in its form, that one feels doubtful about venturing upon any explanation of its origin. In sailing up the Pei-ho, I was struck with the seemingly endless number of grave mounds. This is peculiar to all the northern part of China. These mounds vary from a yard in diameter to that of the great tomb of Yung-lo, which is about half a mile in circumference. The simple grave-mound was the most primitive form of sepulchre. We know it in the present day as the "tumulus" and the "barrow." It became the "cairn," or heap of stones, and this ultimately developed itself into the "pyramid," or tomb, among the Egyptians. The "dagopa" is only another form of this development, and is only a round pyramid, for it is also a tomb, or a relic-holder; for burning the body and preserving the ashes is the characteristic of the Buddhist system. I have no hesitation in saying that all temples are founded on tomb worship. I am aware that this is a question upon which many varieties of opinion have been expressed; but after much travelling and study of temples, I have no doubt in my own mind on the matter. During the Crimean war I went with the expedition to Kertch; and as we sailed up the straits of that name, I remember being struck with what seemed gigantic molehills all round. They were sepulchral tumuli; and Dr. Clarke, whose works are now old, although not yet forgotten, describes them, and thus speculates:—In view of labour so prodigious, as well as of expenditure so enormous, for the purpose of inhuming a single body, customs and superstitions are manifested which serve to illustrate the origin of the pyramids of Egypt, of the caverns of Elephanta, and of the first temples of the ancient world. In memory of the 'mighty dead,' long before there were such edifices as temples, the simple sepulchral heap was raised, and this became the altar upon which sacrifices were offered." The writer is here mistaken in his reference to Elephanta; it is a Brahminical temple, and the temples of that religion are in a sense an exception to the rule here laid down, and yet, I think, not altogether so when properly understood. In India we have to do with the Aryan; in China it is the Turanian race, and among them the tomb-temple theory seems to have no exceptions. Readers of Mr. Fergusson's writings will be familiar with their tomb-building propensities.

The theory I would suggest is, that the Temple of Heaven in Pekin is made in imitation of a sepulchral mound. It would be important to know if any one was buried there, or if there is any tradition as to relics of a human body having been deposited,—a point on which I have no information. Still, without this, if its origin has been as here suggested, it may be considered as a symbolical tomb; the architectural features upon it being a growth, and repeating in another way the development already described in the pyramid and the dagopa. The south altar is named in a manner to confirm this. None of the Chinese words which signify temple are applied to it. It is called *Tien-Tan*, or "Heaven's Altar"; but in the oldest times it was called *Nan-Tan*, or "South Mound"; and *Yuen-Kieu*, or "Round Hillock." These names in themselves seem to indicate the original character of this temple, and as it were exactly repeat Dr. Clarke's words, that "the simple sepulchral heap was raised, and thus became the altar upon which sacrifices were offered." *Shih-Lutze*, or "Altar of Sacrifices," is another of its names.

I think that a confirmation of this theory may be derived from the plan of the south altar. The ordinary grave mounds in the north of China, where they are in their complete form, have a square platform of earth on which the mound is heaped. Now almost every Chinaman has read the classic books of his country, and he is aware that the square form symbolises the *Earth* or the *Yin*, and that the mound also symbolises *Heaven* or the *Yang*. We have the statement from the Chinese authorities who constructed the Temple of Heaven, that it represents the *Yang*, and we can see from the plan that it stands in a square enclosure, giving us the *Yin* form; and thus realising the whole principle upon which a Chinese grave is arranged. The essential parts of the temples of China is the tablet with the name of the god to whom the temple is dedicated, and before this is a table with five vessels. The centre one is for incense, what we call "joss-sticks," are burned, but the Chinaman in his flowery style, calls them the "Fragrance of an hour." The vessels on each side of this are for candles, and the other two are for flowers. A clerical friend has informed me that this is exactly what the Church of England permits upon an altar. Incense may be used, but it must be in a stationary vessel; two candles may be upon the altar, and flowers are not objected to. It is curious that East and West should be so close in their ritualistic rules; for it can only be by an accident that it is so. I may also mention that the theatre is still a part of the temple all over China. Every temple has not got a theatre, but the conjunction of the two is very common; and giving us an illustration of the retention of ancient forms, a tendency which is perhaps more marked in China than in any other country in the East.

The official residence of a mandarin, or a court of justice, is called a *Ya-mun*. Now *mun*, the second syllable of this word, means "gate." I tried when in China to discover why this was so, and what were the ideas of the Chinese themselves; but could get no information. I naturally thought that it might be some remnant of the old idea of the king or judge sitting in the gate, and judging the people. I have described to you sepulchral monuments such as they are when ordered by the Emperor. I have now to describe another kind of monument, which are so common in China, that you can scarce move without seeing one, or the fragments of them which time has left. They are called "Pailows," and are in the form of a triple gate. They are generally put up as a reward of virtue, or good deeds; most usually they are erected in honour of virgins, or of virtuous widows, who have not married a second time. The word "pailow" has two syllables: the first means board or stone slab, and the second means upper story; so that the word is derived from the inscription being upon a slab between the upper lintels of the gateway. Although now generally constructed with large slabs of granite, the original wooden model is so exactly repeated, that we need have no doubt as to what it was; and the perfect identity of construction between these pailows and the gateways of the Sanchi Tope, which is one of the oldest architectural erections in India, would seem to indicate a closer intimacy of connexion among the races in that part of the world than we have yet realised. I exhibit a picturesque old pailow from Nanking, which will explain this wooden construction. You will see that the stones have been mortised into each other as if they had been logs of wood. In the photograph of the south altar of the Temple of Heaven three of the gateways can be seen, and the wooden construction will be evident. I exhibit a small sketch from the native town of Shanghai: it is the base of one of the supports of an old pailow, it is all that remains of it, but it shows one of the features of the wooden origin of Chinese architecture. Its right name would be a truss, but I think "base-bracket" would better express its real character. It is one of the marked members of nearly all Chinese architecture.

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It may interest architects in this country to know how money is raised in China for building purposes. In the streets of Peking I one day found a man in a sort of wooden sentry-box; large nails had been driven into it, so that their points projected through: this prevented the man from leaning against the sides, and the only rest he had was from sitting on a board within. He was a monk, and never seemed to sleep, for he had a string with which he night and day sounded a large sonorous bell every few minutes, as a sort of advertisement of his purpose. This was, that the benvolent should come forward with money: each nail represented a sum; when any one paid that sum his name was stuck up on a bit of paper, and the nail was pulled out, making it more comfortable for the hermit within. All the nails represented the necessary amount for the repair of a temple which was close behind. This is a common proceeding for raising the wind for such purposes. I was told that this monk had been two years shut up, and that he would likely be another year before he got out of his cocoon of nails.

Hospital for Consumption, Ventnor.—The Bishop of Winchester has appointed this Saturday, the 13th inst., for the opening of the chapel of the hospital at Ventnor; 1,000*l.* are still required towards the cost of it.

PROPOSED IMPROVEMENT AT HYDE PARK CORNER.

THE WORKS Committee of the Metropolitan Board of Works, at their last meeting, reported that they had proceeded upon the resolution of the Board of the 20th of June last referring it to them to consider and report upon the subject of the formation of a new thoroughfare from Hamilton-place to Constitution-hill. It would be remembered that the question of this improvement had been much discussed, and suggestions for relieving the block of traffic at Hyde Park-corner had been submitted to the Board by the Earl of Longford and the Marquis of Westminster. The committee at once admitted the principle of the desirability of the improvement, and it appeared to them that it would be best effected in a way suggested by the chairman of the Board, after conference with the engineer. By this plan it was proposed that Piccadilly should be widened; that a road should be formed directly opposite to Hamilton-place, running into Constitution-hill nearly at right angles; that the portion of Constitution-hill to the west of this new road should be extended into Grosvenor-place, and that a new road in continuation of the present north end of Constitution-hill should be carried over the above-mentioned extension direct into the gardens of Buckingham Palace, for the private use of her Majesty alone. As, however, the execution of this, or, indeed, any design, must affect the Green Park, it was necessary that the question should be submitted to her Majesty's Government, in order that the Board might ascertain whether to expect any and what co-operation in the formation of the proposed new road. The committee, therefore, as authorised by the reference to them, had an interview with Mr. Ayrton, the First Commissioner of her Majesty's Works, &c., on the 28th of July last, when they submitted a plan to him. Owing to the late period of the season the subject was not brought before the Cabinet until the resumption of their sittings in the present month, and the committee had now had before them a letter from the Office of Works, stating that the Government are not prepared to bring in a Bill to give effect to the Board's proposal, and that it is therefore not in the power of the Commissioner to proceed further in the matter. Under these circumstances, it did not appear to the committee that the Board could, with any advantage, take further action in the matter, and they recommended that the reference be discharged. In connexion with this subject, the committee had also a letter from Messrs. Boodle & Partington, on behalf of the Marquis of Westminster, submitting that the widening of the upper part of Grosvenor-place, at its junction with Piccadilly, would form a complete scheme in connexion with that under the consideration of the Board, transmitting a plan showing the proposed widening, and stating that the Marquis would be prepared to undertake, at his own cost, to the extent of 2,000*l.*, that part of the scheme representing the widening of Grosvenor-place, provided a place for the deposit of the excavations were given free of cost in the Green Park, within a reasonable distance. The Marquis, accompanied by his surveyor, attended the committee on the 21st of July last, and explained the details of his proposal. His lordship was of opinion that the widening of the upper part of Grosvenor-place would very greatly relieve the pressure at Hyde Park-corner and the neighbourhood, and that the architectural effect of a broad descent from the level of Piccadilly to the Grosvenor-place houses would be very striking. Lord Westminster, therefore, understanding that the Board had it in contemplation to form a continuation of Hamilton-place to Constitution-hill, instructed his estate surveyor to prepare a plan, combining, to a certain extent, the widening of Grosvenor-place with the extension of Hamilton-place, the two projects together forming, in his lordship's opinion, a complete scheme for the benefit of the public. By Lord Westminster's plan, the upper part of Constitution-hill would be cut away altogether, and a new roadway formed into Grosvenor-place on the east side of the Wellington statue, which would then occupy a central position at the head of Grosvenor-place. A road would also be cut diagonally through the north-west corner of the Green Park to Constitution-hill, meeting it at the point of junction with the new road proposed by the Board. It would be observed that this plan, equally with that of the Board, would interfere with the park, and would, therefore, presumably be open to the same objections on the part of her Majesty's Government; moreover, it did not appear to the committee that in itself the plan would meet the exigencies of the case, so far as concerned the traffic at Hyde Park Corner; nor, indeed, did his lordship seem to have contemplated it otherwise than in connexion with the Board's scheme. It was only necessary, therefore, the committee thought, that Lord Westminster should be informed of the decision of the Government, and they recommended this course for adoption, and that a similar communication be addressed to the Earl of Longford, in reply to his letter presented to the Board on the 13th of June last, and referred to the committee; and further, that the governors of St. George's Hospital, who had drawn attention to the great number of accidents which had occurred in Grosvenor-place, be also informed of the position of the matter.

General Sir William Codrington said he understood that the scheme of the Marquis of Westminster was different from the plan of the Earl of Longford. Lord Westminster's proposal stood on its own merits.

Mr. Newton said this question had been before the Board for some time. The committee had considered the plans of the Marquis of Westminster and the Earl of Longford. They waited on Mr. Ayrton, the then Commissioner of Works, who promised to support a plan for a road through the Green Park at Grosvenor-place. Before anything was done Mr. Ayrton went out of office. The Government intimated that they could not approve of any scheme which would interfere with the Green Park, and under the circumstances, the committee recommended that no further action be taken in the matter.

The motion was carried.

ENORMOUS PUMPING MACHINERY.

MESSRS. JOHN & HENRY GWYNNE, of the Hammersmith Ironworks, Hammersmith, are constructing a remarkable set of centrifugal pumping machinery, intended for employment on the reclamation of the Ferrara Marshes, in Northern Italy. The tract to be reclaimed extends over an area of nearly 200 square miles, and the work to be done by the pumps consists in raising a little over 2,000 tons of water per minute. The first pair of these pumps, with their engines, have just been completed. It is difficult to realise what is meant in saying that certain pumps have to raise 2,000 tons of water per minute. 2,000 tons, or 456,000 gallons, per minute, equal 656,640,000 gallons per day of twenty-four hours. According to the latest return, the total quantity of water supplied by the whole of the London waterworks is a little under 110,000,000 gallons per diem, so that it will be seen that the quantity of water to be dealt with by the Ferrara pumping machinery amounts to six times the whole metropolitan water supply. Again, 456,000 gallons, or 72,960 cubic feet per minute, would supply a stream over 103 ft. wide and 4 ft. deep running at a speed of two miles per hour, or 176 ft. per minute; while the delivery for a single day would suffice to fill a reservoir a mile square to a depth of about 3 ft. 9 in.

THE LONDON CENTRAL TELEGRAPH OFFICE.

THE "New Post-Office," of which we gave a view and plan on the 1st of February last, is to be used as the Central Telegraph Office connected with the Post-office, St. Martin's-le-Grand. The workmen are still busy with its interior fittings, but the great telegraph-room is being rapidly set in order; a portion of the departmental staff (which is to occupy the new building, and thus leave the General Post-office entirely free for letters and newspapers) has already moved across the road; and in a few weeks the clerks and instruments from Telegraph-street will take possession of the upper floor. As the great central telegraph-office of the kingdom, it will afford not only ample accommodation for actual needs, but sufficient room should the telegraph service develope even to twice its present dimensions.

All along one side of the great telegraph-room are ranged the curved leaden tubes and brass fittings of the pneumatic delivery apparatus, looking somewhat like a row of gigantic beer-engines. Eighteen miles' length of this pneumatic tubing is laid to twenty-five telegraph-stations in the City and Westminster, which can thus deliver their telegrams at the central office in parcel form faster than the messages could be sent by wire. The messages are enclosed, twelve or sixteen at a time, in despatch-tubes, which are shot along the exhausted pipe to the counter of the central office. From the counter they are carried to the check-table, whence they are distributed, partly by messengers and partly by travelling-tapes, to the clerks at the instruments. The post-office being the only collectors and distributors of messages, telegrams for the cables and lines of private companies come to this central office, and are sent thence to the offices of the companies by pneumatic despatch. The 440 wires working directly from the telegraph-room are in communication with upwards of 1,000 stations. The battery-room on the basement will have 25,000 battery-cells, and here, again, the wires are collected together at a test-box studded with innumerable brass finials. These test-boxes, which look something like railway ticket-offices, enable a defect in a wire to be at once traced out and set right. The gutta-percha-covered copper wire, of which there are 300 miles' length within the building, is manufactured with beautiful accuracy.

Leaving the spacious instrument-room (the telegraphic workshop and executive are lodged on the same floor), we notice through the windows the great chimney rising from the boiler-house built in the floor of the south court. Descending a staircase under a handsome skylight, we pass the departmental offices of the lower floors, and, turning along corridors, always well lighted, descend to the engine-house, on the floor of the north court. Here are being built the three engines of 50-horse power each for the pumping work of the pneumatic-tubes, and two of 10-horse power to draw water from the well of 400 ft. deep which is being sunk on the premises.

The new offices will have cost altogether, when complete, about 450,000*l.*, of which 300,000*l.* have been swallowed up by the site.

The mails and telegraphs of the kingdom will now have only a street between them, the chief Money-order Office will remain in its building in Aldersgate-street, and the Savings-bank will be moved from St. Paul's Churchyard to the vacated premises in Telegraph-street.

THE PROPOSED INCREASE IN THE PRICE OF GAS.

AT the last meeting of the Metropolitan Board of Works, the Works Committee brought up a report recommending that the Gaslight and Coke Company be informed, in reply to their letter, inquiring whether the Board is disposed to agree with the company for an increase in the price of gas in order to meet the extraordinary expenses of the year 1874, that the Board cannot agree to their suggestion, but will be compelled to oppose any application which the company may make for an increase in the price of gas.

Mr. Newton, in moving the adoption of the report, said that the recommendation of the committee in this matter had arisen in consequence of an application which had been made by the Gaslight and Coke Company. Under the circumstances, he said, the committee felt that the Board ought not to allow a further increase in the price of gas without setting up a most determined opposition to the claims of that company. He believed also that the Board ought not to agree to a continuation of the present price of gas, but thought there ought to be a considerable reduction in it. He did not believe in the reasons put forward by the companies for the increase of the price. True, coal had risen; but, on the other hand, the price of the gas products and of coke had gone up in a corresponding manner. Therefore, he was sure the Board would be justified in offering the strongest opposition to the proposal of the company to increase the price.

Mr. Watkins, in seconding the motion, said a few years ago he bought coke from the Imperial Gas Company at 8s. per chaldron, but the price was now 30s. and 32s.!

Mr. Leslie hoped the Board would go before the judges of the land and protest against the imposition of the gas company. The average price of the coal used by the company for the present year was 1*l.* 3s. 6d. per ton, and that of the gas products 10s. 9d., thus reducing the price to 12s. 9d.

Mr. Freeman hoped the time would come when the gas and water companies would be

managed by some central board, for the benefit of the consumers. He would like to see some strong corporation which could take up the matter, with this end in view.

The motion was then put and carried *nem. dis.*

Mr. Leslie afterwards moved a long motion, the effect of which was :—

"That this Board resolve to prepare for immediate action, either offensively or defensively, against the Gas Light and Coke Company, either in equity or law, to compel the company to carry out the Metropolis Gas Act, 1860, outside of the City of London, in the way the judgment of the Metropolitan Board may determine as most effectually to insure a better and cheaper supply of gas to their constituent ratepayers, and a riddance of the grasping effects of amalgamation and mismanagement."

Mr. E. D. Rogers seconded the motion, which was negatived, on a division, by six to four votes.

NORTHFLEET.

Sir,—The village of Northfleet, near Gravesend, is in great need of houses suitable for working men, more especially now the large ship-building yard there is satisfactorily let, and two new cement works will be in full work very shortly. Many of the men at present employed in the various cement works are compelled to live in Gravesend and in different villages, on account of the overcrowding. A builder would do well to take a trip down there, and judge for himself.

An Inhabitant.

OXFORD ARCHITECTURAL AND HISTORICAL SOCIETY.

The members of this Society had their last walk for this term on Saturday before last. There was a large gathering.

The party first visited Queen's College, where they were received in the hall by the Provost and several of the Fellows, and the Rev. A. H. Sayce gave a history of the college, remarking that it stood upon the site of Temple Hall, Gutter Hall, and other similar institutions, the names of which had long been lost. The rev. gentleman then gave an interesting account of the large collection of valuable deeds and documents in the possession of the college, which numbered about 30,000.

The Rev. J. R. Magrath next explained the numerous pieces of plate which had been spread out on the hall tables, and the various pictures which adorn the walls.

The party next visited the libraries, chapel, and other portions of the college, where they found much to interest them.

After votes of thanks, on leaving Queen's College, the party visited and inspected the Church of St. Peter-in-the-East, where they were received by the Rev. J. R. King, the vicar. The general design of the crypt, with its four entrances, two originally communicating with the nave, and two with the chancel of the church, having been explained by the vicar, the party proceeded to the church, where the alterations and improvements, which we have recently described, were also pointed out by Mr. King.

Mr. Jas. Parker then communicated some particulars respecting the crypt and its history. Dismissing the mythical account of the building of the church by Grimbald, in the ninth century, and showing the inconsistency of the details in the chronicle which records it, he said that he was disposed to assign to the crypt an earlier date than he had on a former occasion considered to be probable; and that, judging partly from the notices of the church in the Domesday Survey, partly from the strong resemblance of the architecture to that of St. George's Chapel, formerly in the Castle of Oxford, he was now inclined to think that the crypt and the lower part of the wall of the church were of earlier date than the superstructure, and might with great probability be referred to the work of Robert D'Oiley, the builder of the castle, who is recorded to have been a "builder of churches." This would place the building at about 1070 to 1080, or nearly a century earlier than the main building of the chancel, which might with great certainty, from the many points of similarity, be pronounced as of contemporary workmanship with Iffley Church. However this might be, the plan of the crypt he declared to be a relic of a still earlier age, the only instance in England of any similar arrangement being at Ripon and Hexham, and only a very few examples of its later continuance being found in France. It was, however, the common type of the crypt of the fourth century downwards, and in Italy the examples were still very numerous. He thought that the original church probably consisted of a low chancel, with a very short nave.

In confirmation of Mr. Parker's view, as to the date of the chancel,

The Rev. J. R. King pointed out that the south wall of the nave, to a point west of the porch, was obviously built at the same time as the chancel, and that the Norman doorway under the porch bore a striking resemblance to one of those at Iffley.

Votes of thanks having been given to the Rev. J. R. King and Mr. Parker, the company dispersed.

THE SETTING OUT OF SLOPES.

SOCIETY OF ENGINEERS.

At a meeting of the Society of Engineers, held on Monday, 1st inst., Mr. Jabez Church, president, in the chair, a paper was read by Mr. Charles Julian Light "On a New Method of Setting out the Slopes of Earthwork." The author divided the conditions under which this operation has to be performed into three classes. 1. When the cross section is practically level. 2. When the inclination of surface in cross section is fairly uniform and exceeds 1 in 100. 3. When the cross section is irregular and rough. The proposed new method dealt with the second and largest class. The author then briefly described the ordinary process by successive approximations, and said that for this he proposed to substitute direct and exact measurement on the surface of the ground, based upon data easily obtained, and deduced from tables of a simple form. He then showed that the general formula for the side-width, measured from the centre peg along the surface of the ground is,—

$$A \frac{F \pm SH}{M \mp SD}$$

Where F is the half formation width, H the sectional height on centre line, S the slope, D the difference of level on cross section at a distance A from the centre peg, preferably 100 ft., and $M = \sqrt{A^2 - D^2}$.

Of the two signs in the denominator the + sign applies to the lower side in cuttings and the upper in embankments, and the − sign to the upper side in cuttings and the lower in embankments.

ARCHITECTS' CHARGES.

In a case tried at the Bloomsbury County Court, before Mr. G. Lake Russell, Judge, the plaintiff, Mr. Treherne, an architect, sued Mr. Hart, proprietor of the Alexandra Music-hall, Union-street, Borough, for 11*l.* 3*s.*, being 8*l.* balance of account due to him for furnishing plans for the re-erection of the Alexandra Music-hall, which had been burnt down, and 3*l.* 3*s.* for waiting upon the district surveyor on several occasions. The case was previously tried in this court on the 10th of July last, when the plaintiff was non-suited.

The defendant's case was chiefly that the plaintiff did not supply him with the proper plans for the roof, and that he had to employ another architect, whose charge was 19*l.* 19*s.*, but whose bill, he admitted, was not yet paid.

In cross-examination, defendant also admitted that his house was going to be pulled down by the Metropolitan Board of Works for a new street, and he had promised the job of valuing the premises to Mr. Walters, Messrs. Fox & Bousfield, and half a dozen others who bothered him, to get rid of them.

The District Surveyor's clerk proved that the plans for the building of the new music-hall were not deposited at the proper time, and before the roof was put on they required to see the plans. Plaintiff showed him some drawings at the office one day, but they were not complete. He afterwards showed witness a complete drawing, containing a plan of the roof, but it was objected to. He never saw any other drawing of the plaintiff's. There was a difficulty in getting a drawing of the roof, but he afterwards saw one, said to be Mr. Dunning's, and it was approved, and from that the roof was built.

The Judge said he was of opinion that the plaintiff had not performed his contract. It was true that a design for an iron roof had been furnished by the plaintiff, but it had been objected to, and the plan for a wooden one was supplied by another architect, called in by defendant's foreman, in order to get the building erected in time. This was a second trial, and, the plaintiff having failed to make out his case, he should give judgment for defendant, with costs.

IMPORTANT TO ARTIZANS JOINING CO-OPERATIVE WORKS.

An action brought last week in the Newcastle County Court deserves the especial attention of mechanics belonging to, or starting, co-operative works. The plaintiff, Mr. James Waters, is a mechanical engineer, and the defendants are the Directors of the Ouseburn Co-operative Engine Works, of which concern the plaintiff was formerly a member and workman. The sum sued for was 8*l.* 6*s.*, the amount of wages deposited by Mr. Waters in the concern. As the case occupied part of two days, a *resumé* must suffice to explain the particulars.

Upon a workman joining the Ouseburn Engine Works, the system adopted is, in order to become a member, for him to agree that certain sums of money shall be deducted from his wages week by week, which amount is entered in a book, and as soon as 5*l.* are collected, the man is entitled to a share in the venture. The plaintiff was in that position, and on the 30th of June a certificate was given him for two shares, being the value of 10*l.*, and to that limited liability he was a shareholder in the business so far. The plaintiff's deposits afterwards were increased to 8*l.* 6*s.*; but for this addition he did not apply, nor receive a further certificate of a share, and subsequently he gave the necessary notice to leave the establishment, and he afterwards demanded the return of his deposit-money, which the directors refused to accede to.

Mr. Joel, the plaintiff's solicitor, then wrote to Mr. Rutherford, the managing director of the Co-operative Engine Works, demanding the return of the deposit, or in failure an appeal to a law court.

The managing director, in reply to this, wrote that the directors were exceedingly anxious that the question in dispute should be fairly, liberally, and amicably settled, and that a provision was made for such a settlement in the articles of partnership through a court of arbitration, and not through a court of law; and Mr. Rutherford begged of Mr. Waters to refer the dispute to the court of arbitration, but if in case of refusal, the directors would be compelled to fall back on the rule which recited,—"Any member of the company who refused to submit any question in dispute between him and another member, or other members of the company, or between him and the company, to the court of arbitration, or if he does not submit to the decision of the court, shall forfeit all money in his deposit account."

The Judge, with respect to the above rule and the plaintiff's refusal to proceed to arbitration, ruled, notwithstanding this clause enjoining arbitration upon pain of forfeiture of all moneys deposited by recusant members, that a man had a right and a perfect option, if he thought fit, to have recurrence to the laws of his country, in order that the matter might be settled in a court of law.

This decision being tantamount to a verdict for the plaintiff, inasmuch as the directors did not for a moment dispute having the deposit, Mr. Blackwell, for the Co-operative Company, urged that if this ruling were "law," it would strike at the root of most workmen's societies where a rule for arbitration of disputes existed, and such ruling was very important for the prosperity of the Co-operative Engine Works, and he hoped the Judge would grant a case for appeal to the superior courts at Westminster Hall.

Mr. Joel, for the plaintiff, quite agreed with the other side as to the importance of the case to working men belonging to co-operative works, as this was a representative case.

To draw up the case for the Court of Common Pleas, the evidence of the plaintiff was taken, and the part not here above noticed stated that before the plaintiff was employed by the company he applied for two shares. That was in the year 1871, and he received a note stating that two shares were allotted him. That was his first connexion with the Ouseburn Co-operative Engine Works Company. He paid the sum of 2*l.* into the bank and received a receipt. A general call was made upon those two shares, and he paid a further sum of 2*l.* upon them. There had not been any further calls made upon these shares. He did not join the company as a workman until January, 1873, and at that time he received a deposit-book. Before he received this book he was required to sign as a member for a 5*l.* share. He got the book at his first "pay." After that from time to time he handed in this book from week by week, and the sums entered in the book were deducted from his wages weekly. He signed for two 5*l.* shares under pressure, and for the second 5*l.* share as a workman. He gave notice in writing to leave on the 17th of September, 1873. Upon applying for the money deducted from his wages as deposit-money, Mr. Rutherford, the manager, would not pay it.

The learned Judge wished to see the rules constituting the court of arbitration, and promised to grant a case, *i.e.*, to draw up the facts as above noticed for the opinion of one of the superior courts, which will, upon a motion made by counsel to the judges sitting in banco, give their decision as to the legality of the County Court judge's ruling. If the judges are of opinion that the court below has decided legally, then courts of arbitration for workmen's societies are a mere figment. On the contrary, the plaintiff will be ousted in his County Court action, and have to refer his application for a return of the deposit to the arbitrators of the Ouseburn Co-operative Engine Works Company.

THE FUEL QUESTION.

The Midland Institute of Mining Engineers have held a meeting in Barnsley, at which the question of coal-cutting machinery was discussed. It was resolved that the council of the Institute and a committee of twelve members should be appointed to inquire into and report upon the merits of various coal-cutting machines. The sum of 50*l.* was voted from the funds for expenses, and it was intimated that in the event of any deficiency of funds the district coal-owners would doubtless make it good.

The Belgian *Echo du Parlement* has the following interesting letter from Hasselt, bearing on the question of a substitute for coal :—

"Ten days ago a poor peasant of our neighbourhood went the round of all the coffee-houses with a sack containing earth. He said he had found the means of heating rooms with that substance impregnated with a solution of soda [and added to small coal]. He made the experiment before a crowd of people, and succeeded. Next day the whole town was in great excitement. Everybody had tried the new discovery, and I did the same. Following the man's instructions, I filled a scuttle three-quarters with small coal, and the remaining fourth with vegetable mould; I then sent for a halfpenny worth of common carbonate of soda, which I dissolved in half a litre of water, and then mixed up the solution with the rest. This quantity has been sufficient to warm my room from two o'clock in the afternoon to seven in the evening, at which time I am penning this."

New Fuel awaiting Use.—Among the anomalies of the fuel question, the most striking con-

sists in the fact that the supply of petroleum from the Pennsylvania wells is now at a rate which has reduced its value to 1d. per gallon, and that yet no methods have been brought into general use to utilise this product, either for manufacturing or domestic purposes, so as to influence the price of coal. The present yield of the region is estimated at 30,000 barrels a day. Some wells give as much as 1,300 daily, and new discoveries are constantly being made.

SUNDERLAND TOWN HALL, COMPETITION.

SIR,—The hardihood of the Sunderland Corporation in requesting architects to furnish designs for a town-hall in three weeks is something *surprising*, even to those well acquainted with the nerve of public bodies.

Let me warn the profession against placing too much faith in the instruction issued. I happen to know that at the council meeting to-morrow a motion will be made to upset the whole scheme. It appears that the corporation have no power to build in the park, it being public property, and architects will do well to reflect before they spend their energies on what may come to nothing.

Outsiders are of opinion that it would have been wiser if the council had ascertained whether they really could build in the park before they spent the ratepayers' money in advertisements and instructions.

A RESIDENT IN THE LOCALITY.

THE TRADES MOVEMENT.

Barnsley.—The old Oaks Colliery, near Barnsley, has been idle, owing to the lads who drive the horses refusing to work. Nearly 500 persons have been idle for two days in consequence.

Bristol.—The shipbuilders of Bristol and the Bristol Channel ports have returned to work, having accepted the masters' terms, viz., that the rules of the society which restrict the amount of work to be done by the members shall be suspended until a general meeting of the trade can be called, when they shall either be rescinded or modified.

Limehouse.—On Saturday afternoon a numerously-attended meeting of engineers, principally employed in the steamship building-yards, was held at the Eastern Hall, Limehouse, for the purpose of taking the opinion of the men as to whether they would stand firm for a rise of wages on the 1st of January next. It was resolved:—"That this meeting is of opinion that the time has arrived for us to ask our employers for a rise of wages, owing to the unprecedented rise in the price of provisions; and we would suggest that that rise should be one of 2s. upon the present wages"; and that "unless our employers concede to us the amount asked for, namely, 2s. per week upon our present rate, we are determined to cease work on the 1st day of January, 1874."

ACCIDENTS.

London.—There has been a fatal accident at the National Gallery. A house-painter fell from a scaffold, while at work, and was killed. At the inquest, the father of the deceased said he was at work with his son. Deceased went to the far end of the scaffolding for something, when witness heard a shout "A man is over!" He rushed and saw it was his son. The deceased was perfectly sober at the time. A smith said he was at work with the deceased; the plank he was on was not more than 10 in. in width, he was trying with his foot to bring another plank forward, when his foot slipped, and he fell heavily on the next scaffolding, and then on to the ground, fracturing the skull, and smashing the body. Verdict, accidental death.

Halifax.—Last week a serious fire broke out at the silk-mill situate in Wade-street, Halifax. The cause was an explosion of gas in the ground floor of what is termed the "Little Mill." So instantaneous was the fire that in the course of a few minutes three floors were in flames. On the arrival of the fire brigade, with engines, hose, and reel, they could only protect the adjoining property, as the "Little Mill," was soon one mass of flames. About the fate of some of the poor girls who were at work there seems to have been some uncertainty at the time the news was despatched, but five bodies have been got.

Stockport.—A large circus has been blown down. It had been before roughly treated by the wind at Macclesfield, the crown of the tent having to be lowered during the performance. The establishment was at Hazel Grove, near Stockport, and during the gale which prevailed in the evening the large tent was carried bodily from one field to another, and literally torn to pieces. The structure had just been completed. The damage is estimated at 100*l.*

Sheffield.—A tailor's shop in Fargate, one of the busiest thoroughfares in the town, has fallen in, burying the contents of the shop and the furniture beneath many tons of rubbish. Though a number of persons were passing at the time, all escaped uninjured. The shop-people, too, had warning that the building was coming down, and rushed out in time to preserve themselves from injury. An adjoining building is in a critical condition, and has been propped to prevent its falling. The shop on the other side is also much injured, a portion of the falling building having come with terrific force against the side, smashing in all the windows, and forcing in a part of the wall. The cause of the accident is supposed to be the weakening of the foundations by some extensive excavations at the rear. In order to carry these out blasting has been resorted to.

Hartlepool.—A fatal earthslip has occurred at the new dock, now in course of construction by the North-Eastern Railway Company at Middleton, between the Hartlepools. It appears that a number of navvies in the employ of the contractor, Mr. W. Scott, were excavating earth, when, to facilitate operations, they determined to undermine a portion, beside a perpendicular cutting about 8 ft. or 9 ft. deep, and whilst they were thus engaged, the soil above gave way, completely burying beneath it one man, and partially burying a second. A number of fellow workmen ran to the rescue, and quickly extricated them, but both were seriously injured, and one died before reaching the hospital.

ASPHALTE PAVING.

AT the Freemasons' Tavern there has been a crowded meeting, chiefly of omnibus and cab proprietors, to protest against the use of asphalte paving for horse-roads. Sir James Lawrence, M.P., was in the chair, and the meeting was addressed by Colonel Beresford, M.P., and many large horse-owners. The secretary to the London General Omnibus Company said they owned 8,000 horses. Their annual loss on the old roads was 114; but since the introduction of asphalte it had risen to 202. How this can be from deaths by falling on asphalte, considering the comparatively very small proportion of asphalte road throughout London, he did not explain; nor did he speak of the relative number of horses, although the Omnibus Company now supply tramways with horses, in addition to their own omnibuses. That the asphalte, however, when greasy, or between wet and dry, plays serious havoc with horses we know well from personal experience. At the meeting resolutions were unanimously adopted, condemning asphalte, praying Parliament to order its removal, and urging the Board of Trade not to lay any more.

Something must be done to get rid of the serious defect in asphalte if the use of it is to be continued. In other respects,—that is, at other times than between dry and wet, or in fog,—its advantages are admitted.

Wood-paving is turning up again, notwithstand its repeated failures both here and in New York; but it is to be hoped some very different kinds than those heretofore tried will first be tested. Slipping of horses, we well remember, was just one of the chief objections urged to them; and also their want of lasting nature.

A correspondent of the *Morning Post* speaks of an invention of Mr. Norton (of Tube-well notoriety), which is applicable both to wood and granite, and renders pavement so constructed perfectly water-tight and impervious to wet. Mr. Norton's process he understands to be as follows:—Blocks of wood or granite are placed in a mould of any required dimensions upon a backing of planking, crossed at right angles, and are then embedded in asphalte, the contraction of which in cooling leaves a vacuum at the top of the interstices of the blocks, afterwards to be filled up with coarse gravel. The wood backing is also entirely coated with a bituminous cement, and thus the whole slab is taken from the mould a homogeneous mass ready for being carted away to its required destination. The fact of these slabs being manufactured under cover, the rapidity with which they can be laid, and the facility of raising them for repairs of gas and water pipes, are, in his opinion, important features in Mr. Norton's system. No delay is occasioned by wet weather, and he says skilled labour is unnecessary.

All this, however, does not much alter the nature of wood paving. As for asphalte, it is to be hoped the asphalte companies will speedily find out some method of obviating the tendency to greasiness at certain times. Some simple mixture or mode of working the composition in laying it down may do so. It is notable how little *may* be required to effect this. By way of illustration, we may instance the common little experiment called the "Magician's sand," which may be put into water without becoming wet, by simply sprinkling it while hot with oil, which appears to evaporate entirely from it. We do not speak of this as a suggestion of use in this case, but even this we may at least say, that if such sand were well mixed with asphalte, it is hard to say but what the cure of the defect of greasiness *might* be thus completed.

WATER SUPPLY FOR VILLAGES.

Mr. ROSE, of Rayners, through the *Times*, gives practical advice for securing a supply of water in villages where there is difficulty in obtaining it. On the high ground of the Chilterns, he says, where spring-water is not to be found at a less depth than 300 ft., a comparatively inexpensive mode of constructing cottage tanks has long been successfully practised. The plan we find to answer is to dispense with all brickwork for steyning the sides, and merely to plaster the cement on the earth itself. A circular pit of the required dimensions is dug out; and as soon as solid ground is obtained, a dome is built over it with bricks or even with old bats, a manhole being left in the centre, and a pipe inserted at the side for the inlet of the rain-water. The pit is then dug to the proper depth, the earth being drawn up through the manhole, and the sides are then plastered with three coats of Portland cement and sand mixed dry, the first coat in the proportion of one part of cement to three or four of clean rough sand or shingle; the second coat, of two parts cement to three of clean sharp sand; the last coat or facing, half cement and half sand. The bottom is first laid with broken tiles, and then cemented in the same way. The thickness of the three coats of cement is not together more than one inch. Built in this way the tanks very seldom fail, and are less liable to leak than if built in brickwork and then cemented—which is the usual and more expensive plan, as the brickwork, in the process of settling, often cracks the cement lining, and thus causes leakage. Success can be secured in any description of soil, whether clay, chalk, or gravel, and, if done in dry weather, even in sand or loam, if the bricklayer is careful and the materials are good. A tank 10 ft. deep and 6 ft. over is the size usually constructed for two cottages. Experience has proved that a tank of this size, if properly connected, is very rarely empty. An outside estimate of the cost of such a tank is as follows:—Digging and leading, 18s.; ten bushels Portland cement, at 2s. 7d., 1*l.* 5s. 10d.; sand, 4s. 6d.; 250 bricks for dome and manhole, at 40s., 10s.; labour of bricklayer and labourer, 1½ day, 10s.; total, 3*l.* 8s. 4d.; but say, with sundries, 4*l.*, or at the rate of 2*l.* per cottage, this boon of almost priceless value can be supplied. It is little more than the cost of a water-butt and its fittings. The dome is sometimes built after the tank has been dug to its full depth. Tanks of much larger dimensions can be constructed, and are equally successful. I have one that holds 12,000 gallons. It was made twenty-five years ago, in soil partly clay and partly chalk, with a narrow vein of sand on one side. It holds like a china basin, and the lining is as sound and impervious as when first built.

CHURCH-BUILDING NEWS.

Reading.—The new Church of St. John the Evangelist, Reading, has been consecrated. It stands on the old site, and is built in the French Gothic style of architecture of the thirteenth century. It consists of nave, 85 ft. long by 30 ft. wide, and 54 ft. high to ridge, flanked on either side by clearstory traceried windows, with internal arches, supported on Mansfield stone shafts and carved caps and bases. The roof is open-timbered, boarded, and felted, and covered externally with Staffordshire tiles. The chancel has close-boarded roof, with moulded ribs; height to centre, 36 ft.; width, 26 ft. 6 in.; length, 30 ft. The transepts are double-gabled and intersected with aisle-roofs. The tota'

width from aisle to aisle is 61 ft., and length from east to west 111 ft. The organ-chamber is on the north side of the chancel, and is shut off from the transept by a carved and traceried screen. The vestry is 17 ft. by 14 ft. The entrances are by the tower and a north porch, and there is a thin outlet by the south transept. The accommodation in seats on ground-floor is 826, capable of being made 900 by aisle-seats; and the gallery, which is over the west end, is capable of seating 60 children. This gallery is approached by external winding stone stairs, and forms a feature of some importance in the west front. The tower and spire are in course of erection (a portion of which is included in the present contract), but only as far as will cover in the west entrance. The building is of Kentish rag, with Bath stone dressings. The window and door heads have Mansfield and Bath stone arch-stones, set alternately; the whole of the columns are worked in red Mansfield stones. It is intended that the tower and spire, when complete, shall be 150 ft. from base to summit, the spire being of Bath stone exclusively. The woodwork is stained and varnished, and the aisles and chancel are tiled with encaustic tiles. The lighting is by a series of small jets surrounding each capital in the nave and transepts, issuing from a specially designed triplet burner, giving the building when lighted a pleasing appearance. The pulpit is of Caen stone. The reading-desk is of oak. The cost of the building will be about 6,000*l.*, exclusive of tower and spire, which will cost nearly 2,500*l.* more. The boundaries are of the same stone as the main building; and the infant schools, which are in the same inclosure, in every way correspond with the general character of the church. The architect is Mr. W. A. Dixon, of London, and the builders for the whole of the works are Messrs. Niblett & Son, of Hornsey-rise. The carving has been executed for Messrs. Niblett & Son by Sansom, of Kennington, and the gasfitting by Dyer, of London. The church is heated by Woodcock's system of hot air. The duties of clerk of the works have been performed by Mr. E. Green.

Margate.—The new Church of St. Paul, Cliftonville, on the east side of Margate, has been consecrated by the Archbishop of Canterbury. It accommodates 800.

Penzance (*Cornwall*).—The re-opening, after restoration, of the Church of Paul, near Penzance, has taken place. Paul Church is spacious, with a high granite tower. The tower is Perpendicular; but to a good deal of the fabric it would not be very easy to assign a date. It consists of a continuous nave and chancel, with north and south aisles to both, also continuous. The nave and chancel are separated from the aisles by arcades of nine bays, which may be described as of an Early type. The shafts of the columns are of granite, and mostly monoliths. One curious feature is presented by the north arcade: the third bay from the chancel end is very much smaller than either of the others, the arch being of more elegant outline, and its shafts—clearly not the original,—instead of granite, are of a dark stone, and of Perpendicular character. The arch is partially blocked by a low wall. About fifty years ago the church was restored in the worst fashion of the period. Some few years ago true restoration was commenced by the throwing open of the tower arch and allied work. What has been done now is the entire re-flooring and re-seating of the edifice, which has been executed by Messrs. Olver, of Falmouth, at a cost of about 500*l.* When the old floor was removed, the ground beneath was found to have been honeycombed with vaults and graves. These were filled up and secured, and then the new seating was erected, and the aisles laid with tiles. A new pulpit has also been provided, the chancel improved, and the organ renovated,—this last by Mr. White, of Penzance.

Nottingham.—Holy Trinity Church, Nottingham, has been reopened after undergoing restoration. The chief features in the restoration are an enlargement of the chancel, the docking of the high box-shaped pews, and the removal of the organ and choir from the west-end gallery to the chancel. Trinity Church, we understand, was built in the year 1841, from the designs of the late Mr. Stevens, of Derby, architect. The chancel has been lengthened 16 ft. to leave room for the choir, the east window has been opened, and, by the kindness of a friend, filled with stained-glass, by Heaton, Butler, & Bayne, of London. The window is geometrical in pattern, with the symbols of the four Evangelists, flowers, and conventional ornaments in panels. The chancel is filled with pitch-pine stalls. The floor of the sacrarium is laid with Minton's encaustic tiles. In the nave the seats, which were high boxes, have been cut down, the aisles have been made straight, the paint has been taken off the pews and they have been stained and varnished. The ceiling of the nave has been decorated principally in the centre part by bands of colours, with panels between the ventilators. The work has been carried out at a cost of 1,650*l.*, under the personal direction and superintendence of Mr. W. Arthur Heazell, architect. Messrs. Hudson & Facon were contractors for the builders' work, assisted by Messrs. Bradley & Barker in the carpenter and joiner work of the chancel. The decoration work has been done by Messrs. Best & Lea, of Manchester. The painters' work by Mr. A. Gascoyne. The woodwork in the nave by Mr. H. Daubney. The decoration of the chancel is to be completed in a few months' time, when the new work is dry.

Kirkby Knowle.—The church here has been reopened after undergoing a restoration. The church, previous to the restoration, would seat only 150. Besides the dilapidated state of the edifice before the commencement of the present restoration, the place was exceedingly damp and consequently unhealthy. The nave and chancel were of the same width, being extremely limited, and extending only 13 ft. 5 in. across; the entire length of the fabric being 71 ft. 3 in. The roof was flat and low, and being ceiled with plaster, presented an unsightly appearance; whilst the sittings were inconveniently fitted up and arranged, and the flooring moist and uneven. All this is now improved. The plan of the present church, built as it is upon the site of the old, is entirely new. It is much wider, but not quite so long as the former structure. The nave is 35 ft. in length by 21 ft. in breadth; and the church is 32 ft. long by 18 ft. wide. The height of the nave from the floor to the apex of the roof is 28 ft., and the height of the chancel is somewhat less, being 26 ft. The material of which the church is built is mountain freestone, obtained in the immediate neighbourhood. The walling of the edifice is hammer-dressed, and the windows and buttresses are of ashlar work. The tower is at the south-west corner of the nave. It is square, and the bell-chamber has on each of its four sides two windows. The parapet round the summit of the tower is battlemented, and it is about 60 ft. in height. The porch is at the south-west corner of the nave, and the church is entered underneath the tower. The vestry is situated on the north side of the chancel, with which it communicates; and immediately adjoining it is an organ-chamber or recess, there being introduced into it the old chancel arch of limited dimensions, which has been retained in this position. The flooring of the old church was taken up, and the present floor of the nave is of stone paving laid down in concrete. The chancel-floor is laid with coloured tiles from the establishment of Messrs. Maw & Co., of the Benthall Tile Works, Shropshire; and the floor of the sacrarium is paved with encaustic tiles of rich pattern furnished by the same firm. The church is Early English. The roofs of the nave and chancel are similar in character,—high-pitched, open-timbered, and boarded. Welsh slates have been used in covering in the roofs, and the gables terminate with stone crosses. The nave windows are triplets, the stonework above the side lights being pierced with quatrefoils, which, as well as the three lights, are filled in with plain glass, with the exception of the margins, which are coloured. The chancel windows are lancet lights of plain glass. The east window is of three lights, and the west window of two lights, both being filled in with plain glass with coloured margins. The seats are open and of deal, with profile ends of pitch pine, and provided with bookboards. The chancel is fitted up with stalls. The internal fittings throughout, as well as the boarding and timbers of the roofs, have been stained. The church is dry, and is warmed by means of a hot-air apparatus. The restoration of the church was placed in the hands of Mr. George Fowler Jones, of York, and by him it has been carried out. The outlay has been from 1,200*l.* to 1,300*l.* The tradesmen who have executed the various works are as follow:—Masonry, Mr. Palliser, Northallerton; carpenter and joiners' work, Messrs. T. Bellerby & Son, York; plastering, Mr. Councillor Rawling, York; plumber, glazier, and stainer, Mr. Councillor Varvill, York; slaters, Messrs. T. Wood & Co., York; and warming apparatus, the Sheriff of York (Mr. Alderman Dove). Mr. Harrison was the clerk of the works.

Leicester.—Christ Church, which has undergone considerable repairs and alterations, was reopened on Thursday, Nov. 19th. The restoration of the exterior was entrusted to Messrs. Thrall & Vann, masons. The interior has been reseated with open stalls by Mr. J. Plant, a new gallery by Mr. J. Norman, and a vestry by Mr. T. Duxbury. The heating apparatus has been carried out by Mr. W. Richards, ironfounder. A carved oak pulpit and reading-desk have been executed by Mr. W. H. Noble, mediæval cabinet-maker. The old organ has been replaced by a new one, built by Mr. S. Taylor. The above are all local tradesmen.

Books Received.

Messrs. Partridge's Good Little Books.

The Children's Friend; the *Family Friend*; the *Band of Hope Review*; the *Infant's Magazine*; and the *Friendly Visitor*, all well deserve this title. They are all of the same class (a little *over*-good, some people may think), and are noticeable for the excellence of the illustrations. The infant eye cannot be too early educated in the right direction.

The yearly part of the *British Workman*, which also comes to us from Messrs. Partridge, can take only half the title we have given at the head of this notice: it is a good book, but not a little one. Of the illlustrations in this valuable serial we have often spoken. They are capital specimens of the bolder kind of wood-engraving,—drawing and engraving alike good, and moreover they are well printed. The best block in the world may be nullified in the printing. The *British Workman* cannot be too widely circulated.

An Introduction to the Study of Gothic Architecture. By John Henry Parker, C.B. New Edition. Oxford and London: Jas. Parker & Co. 1874.

The fourth edition of the "Introduction to the Study of Gothic Architecture," just now published, includes considerable additions, especially in the foreign part. The Pisan style, for example, is elucidated; and in the English part special attention is called to the construction of walls, as affording a test for age. It is almost too late to say that it is a most valuable little work, and may be studied with pleasure and advantage by general readers as well as by those who are studying architecture as a profession. It forms a companion volume to Mr. Parker's "Concise Glossary of Terms used in Architecture," and the two together may be fairly considered the Grammar and Dictionary of Gothic Architecture.

VARIORUM.

The *Telegraphic Journal and Electrical Review* (Gillman, Boy-court), bound as a volume, forms an interesting record of the progress of the science of telegraphy during the year.——The editor of *Hardwicke's Science-Gossip* (Mr. J. E. Taylor), in the last number for 1873, congratulates himself and his readers on the success of the work, which "never had a larger *clientèle*." We have so strongly urged the necessity for making a place for Natural Science teaching in any scheme of education worthy the name that we need scarcely say we hear with pleasure of the success of this serial. An interest in the study has greatly spread since *Science - Gossip* was established. —— *The People's Magazine*, of which twelve volumes have now been published by the Society for Promoting Christian Knowledge, comes to an end with this December number. This is to be regretted. It needed a more special character than was given to it. —— "Old and New London," by Walter Thornbury, goes pleasantly on; twelve parts having now been issued.—— "British Battles by Land and Sea" (part xi.), and the "Illustrated History of England" (part xcviii.), come to us from the same publishers as the last (Messrs. Cassell & Co.).——The December number of the *Contemporary Review* includes some interesting letters from the late Mrs. Browning to the author of "Orion" on literary and general topics, hitherto unpublished. Others are promised.—— Messrs. Henry King & Co. announce the publication of a manual of the law of contracts as affecting architects, under the title of "A Legal Handbook for Architects," by Edward Jenkins and John Raymond, barristers-at-law.——The current number of the *Art-*

Journal says as to "Art-Ornamentation":—"Simplicity, as a rule, is to be met with in the beginning of a style, while men were yet feeling their way, and painfully, laboriously striving after an ideal: hence, ornament is a growth, a development that in most cases can be easily traced; a style of ornament does not spring Minerva-like into existence. The middle period of each style is generally the finest; in its earlier history its course is often erratic, the forms are rude, the conceptions barbarous: time, however, brings a change in all these respects, and for some few years the refined ideal of the artist seems almost, if not quite, reached. A period, however, shortly, and too soon, arrives, when men, proud of past success, degrade their art by making it the medium for a display of their own exceeding cleverness; art-beauty for its own sake, or its teachings' sake, is no longer the high consideration, the lofty aim, and the style that under purer aims slowly grew, arrived at a time when manual dexterity enables the designer clearly to express his meaning, is approaching the most perilous period in its history, since this very dexterity speedily becomes its pride and weakness, and the art, once so expressive and refined, loses its hold of men's regard, and expires, choked by the wanton excess of ornament and fatal complexity and redundancy everywhere manifesting themselves. Complexity is, however, not of necessity a sign of decay, though it frequently accompanies it, as at one and the same time both principles, simplicity and complexity, may be found."——The *Gardener's Magazine* gives some suggestions as to planting trees in great cities. The writer says,—It must be confessed that to plant trees in any great city in a creditable manner is, comparatively speaking, a costly business. If the work is not well done, it had better be left undone. The trees selected should be such as have been several times transplanted, and allowed ample room to form good heads, and, in fact, have been "carefully made," with a view to being sold at a good price for first-class planting. Having secured such trees,—no easy matter,—it would be sheer murder to crush their roots into little holes and close them in with the soil of the locality. The leakage of gas-pipes and the incessant traffic render the common soil of all much-frequented city streets unfit for young trees fresh from the country to begin life upon. The holes made should be at least a yard square and 3 ft. to 4 ft. deep, and sufficient good mellow soil should be provided to fill in around their roots comfortably to give them a start. When established, their roots will run into the hard soil all around and do well; but, if required to take such food without being gently inured to it, they will probably die very soon or simply live to prove a nuisance. In all city planting the object should be to produce an effect at once; for as soon as the public eye is gratified the cheese-paring members of the local board will be effectually silenced, and it will be agreed all around that the money was well spent.——The Christmas number of the *Graphic*, besides an interesting story by Mr. Anthony Trollope, "Harry Heathcote of Gangoil," fully and well illustrated, includes a large and effective wood-engraving and a calendar for the new year.

Miscellanea.

Ipswich School Board.—None of the plans offered for proposed schools in London-road have been adopted, but that of Mr. Binyon, modified, may be carried out provided the tenders be satisfactory. Mr. Binyon proposes concrete as an alternative, if brick cost more than enough, and he has been requested to prepare the specifications so as to admit of alternative tenders for concrete and for brick. Mr. Eyton, the architect, has written to the Board, as requested, as to cracks in the walls of the Argyle-street schools. Several arise, he states, from shrinkage of the timber lintels and two from settlement. The site was an old brickyard excavated 20 ft. deep. These cracks have not enlarged for the last six months. Great credit, he says, is due both to the builder and to the architect of the schools that so few settlements have occurred on such a site.

Society of British Artists.—The Winter Exhibition now open in the Suffolk-street Galleries consists of 930 paintings and drawings, and five small pieces of sculpture. It includes many good pictures, and is an agreeable collection as a whole.

Metropolitan Meat and Poultry Market. The memorial stone of the western extension of the Metropolitan Meat and Poultry Market, Smithfield, has been laid. Upwards of 1,000 vans and carts have been daily employed in bringing or removing the meat, and the committee, being impressed with the necessity for additional market accommodation, instructed Mr. Horace Jones, the City architect, to prepare designs, plans, and estimates for utilising with that view a portion of the vacant land belonging to the Corporation on the south side of Charterhouse-street. Mr. Jones's plan is now being carried out, and provides four avenues running east and west with two entrances from Farringdon-street and two from the existing market. The elevation has been designed to harmonise in general character with that of the existing market. The area of ground that will be covered is about 49,000 ft. superficial, of which the shops, seventy-two in number, will occupy 29,500 ft. The annual revenue from the annexe is estimated at 10,903*l*. The outlay by the Corporation for the scheme will be recouped them by the tolls levied upon the meat brought into the market for sale in the seventy-two new shops. The building will be completed in about nine months, and the contractors are Messrs. Holland & Hannen.

The Metropolitan Railway in Turkey.—The difficulties which have arisen on the subject of the works of the Metropolitan Railway,—the underground communication between Pera and Galata,—are once more said to be settled. The representative of the concessionaries of the undertaking has authorised the Imperial Ottoman Bank to pay to the owners of property expropriated along the line of route the stipulated value of the property, out of the fund deposited with the bank for that purpose, and permission has in consequence been given to the contractors to resume and complete the works for the construction of the tunnel.——The *Levant Herald* says,—"We learn that one of the differences which had arisen between the Government and the contractors of the Scutari and Ismidt Railway has been settled by arbitration; an award having been made of a little more than half the sum claimed by the contractors. We could wish to see the same method of solution sought in other cases of difference, for it is of the utmost importance that, in the present critical situation of the empire, the conviction should be re-established that the Government is guided through all its difficulties by a spirit of justice and equity. This belief once again impressed upon public opinion would materially assist the recovery of the national credit."

Creeping of Rails.—The "creeping" of railroad rails has attracted some attention of late, and, while we do not attempt to explain it, we offer a point on the fact that, on lines running north and south, the western rail "creeps" faster than the eastern rail; that is, this strange movement of the rail towards the south is more marked in one rail than in the other on the same track. Furthermore, it has been noticed that on such a line the eastern rail wears out the fastest. Both of these points, we think, can be explained by the motion of the earth as it turns from the west towards the east. Everything that has free motion is dragged after the whirling globe; every wind that blows and every tide that moves feels the influence, and our train going north or south is pulled over towards the east, and naturally presses the eastern rail most heavily. The western rail, being relieved of its share of weight, "creeps" more freely and quickly. It is also noticed that the wheels that run on the eastern rail wear out the first, and we can but think that this earth motion is the true cause. The practical side of this is that the eastern rail and wheels should be stronger. —*Scientific American.*

The Steam Roller and the Gas.—The Kensington vestry have received from Sir J. Karslake and Mr. Horace Davey, the following opinion as to whether the vestries and the local Boards are liable to make good to the gas company the damages sustained by the said company, or which it may sustain by reason of the use of the steam roller:—"We think that the gas company can maintain an action at law in respect of such damage, or if there is any case in which it is reasonably apparent from past experience that great injury to the company's mains and pipes, and danger from the consequent escape of gas are likely to ensue, we think that the company can maintain a suit in equity for an injunction."

The Anglo-French Tunnel.—The French Commission for inquiry into the scheme for a tunnel beneath the English Channel assembled at the Prefecture of the Pas-de-Calais, at Arras, on Monday last, to examine the statements sent in from the sub-prefectures and the reports of the chambers of commerce. M. Martel, vice-president of the National Assembly, and president of the Commission, was in the chair. The Tunnel Company was represented by Lord Richard Grosvenor, M.P., M. Michel Chevalier, Sir John Hawkshaw, Mr. Brunlees, C.E., M. Bergeron, C.E., M. de Gamond, C.E., and others. The sitting lasted about three hours. The commissioners are supposed to have ruled that, as this scheme had not been referred to them by the Minister of Public Works, they were not competent to pronounce any official opinion upon its claims. They could therefore only hear Mr. Low as a critic of the scheme actually before them. The Commission will assemble in Paris on the 15th inst., in order to adopt its report.

The Boarding-out System for Pauper Children.—The clerk of the Kingston Union, Surrey, lately wrote to Sir Charles Trevelyan:—

"For years, whilst our pauper children were at Penge District School, out of about 150 we had a return, *every week*, of from twenty to thirty as being reported to be in the Infirmary, too ill to be discharged."

The Kingston Guardians have since boarded out fifty of their children in carefully-selected cottage-homes in their own union, and at a much less cost. The clerk states,—"This system is working to the satisfaction of the Board, and to the great delight of the children." Nearly 2,500 pauper children are thus boarded out now in various unions of England and Wales. A considerable saving to the ratepayers is thus secured, whilst the children are brought up in a more practical manner, with greater sympathy and kindness, and under the more natural and more healthy conditions of family life. Those taking an interest in this system, can obtain papers and information from Miss Mary J. Catlin, 21, Arthur-road, Stoke Newington.

London Trades Council.—The annual report and balance-sheet of this council, from July 1st, 1872, to June 30th, 1873, has been issued in a printed form. It states that "the general work done by the council has been considerable, and, in addition, much organising labour has been required. Credentials for the support of the London trades have been given during the past year to the London cocoa-fibre mat-makers, the London tobacco-pipe makers, the Edinburgh printers and tailors, who were greatly assisted thereby, and for which the council was tendered their thanks. In order to accomplish the labours of the past year, one ordinary and nineteen special summer delegate meetings, and three ordinary and twenty special council meetings, have been convened. Although great progress has been made in securing the affiliation of a considerable number of important societies, there are still many others whose duty it is to help the onward march of labour, and join in the general work to be done."

Crystal Palace.—The *conversazione* given by the committee of the Crystal Palace School of Art, Science, and Literature, the directors of the Crystal Palace Aquarium, and the president and committee of the South London Microscopical and Natural History Club, in the new buildings of the School of Art, Science, and Literature, and in the Aquarium, on Friday, December 5th, passed off very successfully. Mr. Thos. Hughes, M.P., and other gentlemen connected with the undertaking, made brief addresses, and there was some excellent music. With reference to the secretaryship, the directors of the Crystal Palace Company have elected Captain Flood Page to succeed Mr. Grove at the end of the year. Captain Page has long been known as an active member of the executive committee of the Wimbledon rifle meeting, in addition to which he acted for some years as agent for Lord Spencer's Wimbledon property. Mr. Wilkinson will become general manager of the Crystal Palace.

The Iron Gates of Holland House.—It is stated in a London newspaper, on the authority of "a gentleman of the locality," that "the well-known iron gates in the Hammersmith-road, facing the street leading to Earl's-court, once formed the main 'grille' of the Bastile," with some metal ornaments added. What truth or error there may be in this we do not recollect.

Alterations in the Plane of the Tay Bridge.—Unexpected difficulties having been encountered in the foundation of a number of the piers of the Tay Bridge, in consequence of the existence of clay and sand where rock had been calculated upon, the contractors have found it necessary to propose, and Mr. Bouch, the engineer, after careful consideration, has now fully sanctioned, some important alterations in the method of construction. It is intended to enlarge the base of each cylinder from 9 ft. 6 in. to 15 ft. diameter, and as there are two cylinders in each pier, this will give 30 ft. instead of 19 ft. in diameter. Several of the new cylinders are in course of construction, and two are ready to be floated out to their places. One important advantage of the change is, that it will greatly facilitate the making of the bridge hereafter serve for a double line; and, in carrying out the plans, the future doubling of the rails is to be distinctly kept in view.

Cambridge Antiquarian Society.—At a meeting of this society on the 24th ult., Professor C. C. Babington in the chair, the Rev. W. Griffith, M.A., fellow of St. John's College, exhibited a curious series of celts and similar implements, chiefly of shell, collected by him during a recent residence of nine months in the island of Barbadoes. The native aptitude of the Charibs for tedious labour was shown by the case of a Coolie at Lazon, in St. Vincent, who, instead of buying a needle, spent a week in working a piece of thick iron wire upon a stone into the required shape. The shell tools have great variety of form, suggesting the uses now fulfilled by our hatchet, adze, chisel, gouge, knife, spoon, and possibly drill; for warlike purposes they do not seem so well adapted.

Carlisle New Board Schools.—The foundation-stone of the first new schools to be built by the Carlisle Board has been laid. The School Board invited the Corporation and the general public to attend the ceremony. The style of architecture may be considered Mediæval or Gothic, of the Tudor period, the chief being many-mullioned windows, with transomes or cross-bars at intervals, high-pitched roofs, gables, and an ornamental, yet inexpensive, brick cornice. The plans were prepared by Mr. D. Birkett, of Carlisle, architect, and were selected by the Board as the best out of a number sent in for public competition. Improvements were made in the plans. The material is brick.

Bradford Infirmary and Dispensary.—A new and commodious building, erected for the purposes of a dispensary, at a cost of more than 6,000*l.*, on one side of the Bradford Infirmary, and fronting to Westgate, in that town, has been formally opened. In the unavoidable absence of the mayor, Mr. Edward West presided, and performed the opening ceremony. Mr. W. E. Glyde described at some length the origin and course of the work begun. The building is of two stories, and includes dispensary, waiting, and other rooms on the ground-floor, and above eleven bedrooms, dining, sitting, and other rooms. The expenditure has been defrayed by the subscriptions of friends of the charity.

Proposed New Cemetery at Ham.—A newly-formed private company are taking steps for making a new cemetery at Ham, on a plot of land near the Forest-gate Station of the Great Eastern Railway, which will be about two miles nearer the metropolis than the Ilford Cemetery. The proposed site is to be inspected on Tuesday next by the Inspector for the Burial Department of the Government, with a view to ascertain its fitness or otherwise for the purpose. The Commissioners of Sewers, who are interested in the project on public grounds, will be represented on the occasion of the inquiry.

Increase in the Price of Gas at Manchester.—The Manchester City Council on Wednesday sanctioned the following advance in the price of gas:—To the consumers within the city, 4d. per 1,000 cubic feet; for the consumers beyond the city, 6d. per 1,000 cubic feet; for the gas supplied to the public lamps within the city, from 30*s.* to 35*s.* each lamp per annum; for the gas supplied to the public lamps beyond the city, from 35*s.* to 42*s.* 6d. each lamp per annum. Such advances to commence from the 25th of December next.

A Gymnasium for Bedford.—At a public meeting held in Bedford, according to the local *Times*, it has been resolved to establish a society for the promotion of athletes and gymnasts, and to erect a gymnasium in Bedford; and a committee has been appointed to carry out the objects of the meeting.

The Sewage Difficulty at Birmingham.—A report on the new sewage system in course of adoption in Birmingham was presented to the Town Council of that borough. The Rochdale method of interception from the sewers and weekly collection is being gradually extended. The intercepted sewage is mixed with screened ashes, and sold as manure. No difficulty has been found in getting the landlords to adopt the new system, which is being carried out in some public institutions. The purification works outside Birmingham are also being developed, and the water turned into the river Tame.

New Church at Fulham.—A new church is in course of erection at the western end of May-street, North-end, Fulham, and will very shortly be ready for consecration. It is dedicated to St. Andrew, and an ecclesiastical district out of the parish of Fulham has been assigned to it. The Rev. J. H. Cardwell, M.A., will be the first incumbent.

City Property.—Messrs. Wilkinson & Horne submitted to auction, at the Mart, the premises Nos. 1 and 2, Poultry. No. 1 covers an area of 210 ft., and is held for an unexpired term of twenty years, at 220*l.* per annum; No. 2 covers an area of 466 ft., and is freehold; and the two houses were sold in one lot for 14,600*l.*

Newbury New Cattle Market.—The works connected with this undertaking are being pushed forward, and it is hoped that everything will be completed by the 18th inst., the day fixed for the opening. The architect is Mr. James H. Money, of Speenhamland. The contractors are Messrs. Harrison.

The "Outram" Statue, lately on view in Waterloo-place, will, in a few days, be shipped for Calcutta. We are glad to hear of the formation of a committee for securing, by subscription, a duplicate of this grand work for London. To Mr. G. F. Teniswood, F.S.A., hon. sec., Caton Lodge, Putney, all communications should be addressed.

TENDERS

For the reconstruction, enlargement, and completion, of Billingsgate Market for the honourable the Corporation of the City of London. Mr. Horace Jones, architect. Messrs. Reddall & H. F. Gritten, surveyors:—

Ball & Gammon	£101,776 0 0
Conder	99,997 0 0
Browne & Robinson	99,337 0 0
Perry & Co.	95,684 0 0
Myers & Son	91,853 0 0
Newman & Mann	88,556 0 0
Trollope & Son	86,434 0 0
Hill, Higgs, & Hill	85,987 0 0
Holland & Hannen	85,848 0 0
Mowlem & Burt	80,000 0 0

For stables and coachman's residence at No. 66, Belsize Park-gardens, for Mr. W. Shuter. Mr. Wm. Burnet, architect. Quantities supplied by Mr. Geo. G. Stanham:—

Hockley	£1,987 0 0
Manley & Rogers	1,981 0 0
Newman & Mann	1,975 0 0
Adamson	1,888 0 0
Hill, Higgs, & Hill	1,874 0 0

For a villa residence, Potter's-bar. Mr. Parminster, architect. Quantities by Mr. Thacker:—

Carter	£2,840 0 0
Ranken	2,750 0 0
Thomas	2,749 0 0
Groom	2,697 0 0
Tibbets	2,655 0 0
Pocock	2,650 0 0
Aitchison & Walker	2,625 0 0
Bayes & Rammage	2,620 0 0
Grover	2,545 0 0

For villa residence, with studio, Steele's-road, Haverstock-hill, for Mr. Frederick Barnard. Messrs. Batterbury & Huxley, architects:—

Linzell & Son (accepted)	£1,561 10 0

For the erection of twelve cottages at Royston, for the Royston Tradesmen's Benefit Society:—

Gimson	£1,194 0 0
Presland	1,190 0 0
Walbey	1,180 0 0
Gibbons (accepted)	1,139 0 0

For works in Maidenhead-court, Aldersgate-street. Mr. James Harrison, architect:—

Fairhall & Co.	£315 0 0
Larter	234 0 0
Huckett	175 0 0
Starkey	158 15 0
Couchman	139 0 0

For conservatory at Vernon House, Weston, Bath, for General Doherty, C.B. Messrs. Wilson, Willcox, & Wilson, architects. Quantities by Mr. A. Deane:—

Ridout	£357 13 0
Bladwell (accepted)	336 0 0

Accepted for new billiard-room for the above:—

Excavator and Mason.

Bladwell	£179 15 0

Carpenter and Joiner.

Ridout	£160 0 0

Plumber.

Vincent	£57 12 0

Slater, Plasterer, Glazier, and Painter.

Weeks	£92 9 0

TO CORRESPONDENTS.

W. G. D.—A. M. H.—E. A. H.—B.—E. M.—C.—H. D.—E. B.—C. W.—F. S. B.—J. & A. B.—J. B. D.—Mr. O.—J. G.—F.—M. & T.—G. D.—C. K.—H. S.—B. & H.—C. C.—W. L. B.—J. H.—I. A. L. C.—G. F. T.—E. W.—J. D.—J. C. (send the particulars offered).—A Country Builder (could not recover such a charge, or any charge, except under special circumstances).—H. H. C. (too late).—F. & F. (next week).—F. E. S. (next week).

We are compelled to decline pointing out books and giving addresses.

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

Note.—The responsibility of signed articles, and papers read at public meetings, rests of course with the authors.

SPECIAL NOTICE.

Christmas Week.—*The* Builder *for the week ending December 27th will be published on* **Wednesday, 24th** *inst., at the usual hour.*

Advertisements for insertion in that issue must therefore reach the Office before Three o'clock P.M. *on* **Tuesday, 23rd** *inst.*

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